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ANTICOAGULANTS IN THE MANAGEMENT OF CARDIAC INFARCTION: A PATHOLOGICAL AND CLINICAL STUDY.

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IN his well-known volume "Diseases of the Heart", Sir Thomas Lewis (1942) made the statement that in cases of cardiac infarction "clot usually forms on the affected portions of the endocardium, and this clot may become detached in small or large pieces and give embolism. The emboli may enter and plug any artery in the body, but are more common in the systemic than the pulmonary system". In years past this has been so much a matter of academic interest only that the embolic complications of cardiac infarction were rarely recognized unless some spectacular site was involved, such as a main artery of a limb or an artery of the brain or of the mesentery. With the introduction of systemic anticoagulants—heparin and dicoumarin—it has become possible to prevent the formation of intravascular thrombi, so that evaluation of the part these thrombi play in the natural history of cases of cardiac infarction has become a matter worthy of attention. A large literature attests the interest that has been evoked by a consideration of the frequency with which clot can be found in the chambers of hearts that have been infarcted, and many of the same papers record the presence of infarcts in other organs beside the heart. Little attention has been paid to whether or not the endocardial clot or detached portions from it were significant factors in producing the death of the patient whose record was studied.

The observations set down in this paper took the statement quoted above from Lewis as a starting point, and an answer was sought to two questions. The first question

was to determine the frequency with which mural thrombus was present in fatal cases of cardiac infarction, and to assess where possible whether its presence had contributed in any significant measure to the death of the patient. The work was done during the tenure of a travelling fellowship, which was spent in the Departments of Pathology and Medicine in the University of Leeds, Yorkshire. The cases that form the basic part of the report were found by going through the post-mortem register and abstracting from it the names and serial numbers of all the patients in whom a cardiac infarct had been found at post-mortem examination. One hundred cases were obtained by working backwards from the year 1947 to the year 1935 inclusive. No case in which a cardiac infarct was found was rejected; but the very fact that an infarct could be recognized carries with it the condition that the patient had lived long enough after the onset of symptoms for the characteristic naked-eye changes to take place. The post-mortem notes were searched for a record of clot within a chamber of the heart and for the presence of infarcts in other organs. When this was complete, the clinical records were obtained and an attempt was made to decide the immediate cause of death.

The second part of the study involved the treatment of patients in the light of information obtained in the first part. This has been done in a relatively small series of patients both in Leeds and in Melbourne.

Mural Thrombus.

Clot was present within the cavity of at least one chamber of the heart in 47 cases of this series. It was not found in any case in which death took place within forty-eight hours of the onset of symptoms. In all but four cases the clot was attached to the wall of the left ventricle, but in seven of these the right ventricle and the intervening septum were also affected. In the other four cases the clot was confined to the right ventricular wall. Bean (1938) has recorded an incidence of mural thrombus of 45% in a series of 698 cases culled from various sources.

TABLE I.
Thrombo-Embolic Lesions Found at Post-Mortem Examination of Subjects Dead from Recent Cardiac Infarction.

Author.	Number of Cases.	Sites of Infarcts.				
		Lungs.	Kidneys.	Spleen.	Brain.	Other Sites.
Bean (1938)	300	43	29	17	15	12
Hellerstein and Martin (1947)	160	33	28	17	14	10
Garvin (1942)	133	45	32	19	18	14
Parkinson and Bedford (1928)	83	7	9	8	1	6
Meakins and Eakin (1932)	62	47	14	9	4	13
The present series	100	19	11	6	4	8
Approximate percentages (838 cases)		23	15	9	7	9

Infarcts in Organs Other than the Heart.

In 37 cases infarcts were found in organs other than the heart, but in some cases these were multiple, so that in all 48 infarcts were found. The distribution of these is set out in tabular form as follows:

Lungs	19
Kidneys	11
Spleen	6
Brain	4
Arteries of limbs	4
Mesenteric vessels	4

The incidence of infarcts in organs other than the heart has varied widely in different series that have been investigated. So that a more comprehensive view of this aspect of the problem may be obtained, the relevant findings in other papers are set out below (Table I).

These figures come from papers separated by many years and from different parts of the world, so it is likely that they reflect accurately the extent to which infarction is seen in the various organs once an infarct has formed in the heart.

The Origin of the Infarcts Not in the Heart.

On the authority of Lewis, it should now have been possible to correlate the presence of mural thrombus within the heart and the finding of infarcts in other organs, both the lungs and those of the systemic circuit. When this was attempted for the 37 cases mentioned above, a serious discrepancy was at once obvious. In only 11 cases was it possible to account for the infarcts on the basis that they had arisen as the result of embolism from mural clot. This was especially true in the case of the 19 pulmonary infarcts: in only three cases had clot been found in the right side of the heart. Here was an unexpected finding, and further investigation appeared worth while. It was most unlikely that any source of emboli in the systemic circuit had passed undetected at post-mortem examination in so many cases, so that one was forced to conclude that the infarcts in such cases were the result of local arterial thromboses. The lungs were possibly in another category, because many workers have drawn attention to the way in which clot from veins in the legs or the pelvis may give rise to emboli in the lung. Unfortunately, little attention has been paid by such workers to whether these emboli cause typical red infarction in the lung, which was the state found in these cases. On the other hand, White (1940), Carlotti *et alii* (1947) and others have noted the frequency with which pulmonary infarcts are to be found at the post-mortem examination of patients who have died from congestive cardiac failure. No attention had been paid to the nature of the contents of leg veins in the cases reported in this series in which pulmonary infarcts were found, so no conclusions on this score are possible. But as pulmonary infarcts are common in cases of congestive heart failure, it appeared essential to determine whether infarcts were common in the systemic circulation in this condition, because if this were so, then the infarcts found in cases of cardiac infarction might all be due to the failing circulation. If this were so, the prognosis would not be significantly improved by the use of anticoagulants.

Infarcts in Subjects Dead of Congestive Heart Failure.

With regard to infarcts in association with congestive heart failure, exactly the same routine was followed as in the obtaining of cases of cardiac infarction, and 100 case records were examined. Cases of bacterial endocarditis were not included. In 79 cases arterial disease with or without hypertension was the main factor causing heart failure; in 19 rheumatic fever was the cause of a valvular defect, while the other two consisted of a congenital defect (one case) and syphilitic aortic valvular disease (one case). The relevant findings may be stated briefly. In three cases free clot was present in one of the auricles, but no infarcts were noted at a distance. In 17 cases there were red infarcts in the lungs. In only three cases was there any record of an infarct in the systemic circuit, and in each case this was in the cerebrum. There was no record of an infarct in the kidney or the spleen, but in two cases death had taken place from a massive pulmonary embolism.

The findings in this series of cases of heart failure without infarction of the myocardium are rather different from those reported by Garvin (1942). However, the difference was clear-cut, and the findings are presented without further ado.

Comment.

The findings in this series are interpreted to mean that a failing circulation alone is unlikely to be the cause of an infarct in the systemic circulation in fatal cases of cardiac infarction, although it would appear to be related to the presence of infarcts in the lungs in some manner. The age distribution in the cardiac infarction group and in the congestive failure group, in which arterial disease was the main factor, is similar, and similar also are the frequency and the severity of atheroma as recorded in the notes at the post-mortem examination. This applies to the coronary arteries as well as to others, so far as naked eye examination goes. Thus it is not likely that the cardiac infarction group of subjects suffered from a degree of atheroma of vessels in the kidney and spleen that was significantly greater than that of the congestive heart failure patients. The cause of the thromboses in these sites must be sought elsewhere, and the only other factor involved appeared to be the clotting properties of the blood itself.

Changes in the Clotting Properties of the Blood.

Many workers have sought to demonstrate changes in the clotting power of the blood in conditions in which thrombosis and embolism are common—for example, after operation (Brambel, 1945; de Takats, 1943). Peters, Guyther and Brambel (1946) have paid attention to this problem in cases of cardiac infarction. There is general agreement that minor changes can be detected by means of somewhat complicated techniques, that the change is one which favours an increase in the clotting power of the blood, and that the basis of the change is not known. More recently Lyons (1947) and his associates have described changes in the serum of patients who are liable to thromboses in the circulation, and have developed a test to show the presence in such serum of a substance which they have called fibrinogen B. Recently they have reported its presence in 19 cases of cardiac infarction (Dunn, Jackson

and Lyons, 1949), but make no reference to the time which had elapsed between the onset of symptoms and the performing of the test. In the past year in 16 cases this test has been performed on the serum prior to the commencement of treatment with dicoumarin. In seven cases a positive result was obtained; all these patients gave a history of pain in the chest or other symptoms of more than thirty-six hours' duration. In the other nine cases the test was performed in less than thirty-six hours from the onset, and later tests after treatment was begun all gave normal results. Perhaps the most significant finding in this matter, however, is the fact that in the seven cases in which a positive result to the test for fibrinogen B was obtained, the reaction rapidly returned to normal after treatment with dicoumarin. This would appear to indicate clearly that anticoagulants can bring about a change in the serum of these patients.

Such evidence as is available at present suggests that changes do occur in the blood of patients who have suffered a cardiac infarction which are similar to those seen after operations and other conditions in which intravascular thrombosis is seen. It is tempting to suggest that they are in some measure the basis of the infarcts seen in the various organs and described in detail above.

The Immediate Causes of Death.

The next step was to determine whether or not the thrombo-embolic phenomena found at post-mortem examination to have taken place had contributed in any significant manner to the death of the subject in which they were present. The clinical notes could be found in only 83 cases out of the 100 in which the post-mortem records were available, and the apparent mode of death as recorded at the bedside in each of these 83 cases is set out below:

Death within a few hours of admission to hospital	17
Rapid death following early improvement	20
Clinical bronchopneumonia	24
Peripheral circulatory failure	7
Cerebral thrombosis	4
Progressive heart failure	4
Occlusion of artery in limb or mesentery	4
Notes inadequate for assessment	3

It is of interest to note that infarction was not suspected in any case except when the brain, the mesentery or a limb was involved. No suggestion that pulmonary infarction might have occurred was found in any case history, and no record of hæmaturia, of renal or splenic pain, or of hæmoptysis was seen. On the other hand, it was suggested in twelve cases that a second cardiac infarction might have occurred, on the basis of fresh chest pain and the collapse of the patient. All these cases are included in the group of patients who died rapidly after initial improvement, and in five of these cases the post-mortem notes stated that infarcts of different duration were observed. In the other eight cases, death was even more sudden. Two patients died from massive pulmonary embolism, and clot was found in the main femoral vessels of both. In four cases it is probable that acute arrhythmia was the final cause of death, because in these patients irregular beating of the ventricle had been noted. In the other two, no notable findings were made *post mortem*, but atheroma of the coronary arteries was unusually severe.

The group in which death occurred from "clinical broncho-pneumonia" is also of interest. In 15 of the 24 cases extensive pulmonary infarction was found, but there was little evidence of real pneumonic change. The diagnosis of bronchopneumonia was made on the presence of chest signs and low-grade fever, but when chemotherapy had been given the response had been negligible. An observation such as this merely serves to emphasize how infrequently clinicians recognize pulmonary infarction in cases of cardiac failure.

Now the stage is set to consider which of these patients would have derived a substantial amount of benefit from appropriate use of anticoagulants. Of the 83 patients considered in this portion of the investigation, 17 died too soon for any possible effect to have been produced; thus there were 66 cases from which these final figures are taken. The following is a list of the 37 cases in which it

appears likely that anticoagulants would have served a significant purpose:

Pulmonary infarction	15
Second cardiac infarction	12
Cerebral thrombosis	4
Occlusion of artery in limb or mesentery	4
Massive pulmonary embolism	2

With 37 out of 66 cases entering into the class of those in which anticoagulants would have been useful, it appears as if a strong case exists for the use of these drugs—a case, moreover, which has a basis in clear pathological changes which may be readily observed, and not one that is dependent upon the estimation of some minor change in the clotting powers of the blood alone. Indeed, so common are the thrombotic sequelæ of cardiac infarction that there would appear to be little point in attempting to define any class of case for which anticoagulants should be reserved, but rather it should be concluded that their use is indicated positively in every case in which the diagnosis is reasonably certain.

Before any patients were treated, one other point needed consideration. It was noted that in no case in which death had taken place in the first forty-eight hours was there evidence of clot within the heart or of infarcts in distant organs. Thus it was plainly not a matter of much moment to reduce the coagulation power of the blood very rapidly, so it was determined not to use heparin, even if the patient had been ill for forty-eight hours, unless signs of infarction elsewhere were found. The 100 original patients all died before the twenty-first day after the onset of their symptoms, the majority of them between the seventh and the eighteenth days, so that it appeared essential to continue the administration of suitable anticoagulants at least until the end of the third week of the illness. With this end in view, a series of patients has been treated.

Notes on Clinical Cases.

This part of the paper deals with the experience gained in the use of anticoagulants in 35 cases of cardiac infarction. In most of the cases the diagnosis was made on clinical grounds only, as electrocardiographic studies were made in only 12 of them. It was not deemed possible to follow a control series, partly because of the inherent difficulties of obtaining strictly comparable series when the number of cases one is likely to encounter is relatively small, and partly because so many of the patients were medical men or their near relations. No patient was refused dicoumarin, and this was the only drug used apart from the usually accepted methods of managing such patients. No patient was given papaverine or any other so-called vasodilator drug.

The series consists of 30 males and five females, and the age range was from forty-six to seventy-three years. Six of the patients also had diabetes of some years' duration. Most of them started dicoumarin therapy within seventy-two hours of their first symptoms, but in five cases it was begun only after this time had elapsed. In most of the cases the condition was controlled by the method previously described (Rose, 1948).

Results of Treatment.

The plan of management was to maintain the prothrombin level between 15% and 40% for a period of twenty-one days. Three patients died before this level could be obtained—that is, within seventy-two hours of starting treatment. Therefore, the further notes deal with 32 cases in which treatment might have brought about an improved prognosis. In five cases it proved hard to maintain the level below 40%; in seven cases an undue drop in the prothrombin level occurred after a standard dose of dicoumarin, and in five of these cases there was some degree of peripheral circulatory failure. Virtually no untoward effects were noted: one patient had a moderately severe epistaxis, but it may have been due to other causes, as he was subject to them. Several patients showed undue bruising; but in no case was it necessary to discontinue the drug except for the usual reason of a low level of prothrombin.

Two patients died while under control with dicoumarin. One dropped dead while speaking to relatives on the twelfth day of his illness and the ninth day of dicoumarin therapy. At post-mortem examination a typical infarct was found in the anterior wall of the left ventricle, but no clot was found on its endocardial surface, and there were no infarcts in other organs. No obvious cause for the sudden death could be demonstrated. The other case was one of progressive heart failure, the patient dying on the seventeenth day. No post-mortem examination was possible.

The remaining 30 patients recovered without the recognition of any thrombotic or embolic complication. However, one man, aged sixty-four years, died on the forty-first day of his illness, by which time he was convalescent. Death was sudden, and at post-mortem examination he was found to have a well-formed scar in the heart, microscopic examination of a section of which revealed the presence of normal granulation tissue. No evidence of clot or other thrombo-embolism could be found.

There were seven patients who complained of a recurrence of chest pain at times when the prothrombin level had been adequately reduced. In no case was this severe or prolonged, and no signs were found to suggest either a pulmonary infarction or a new cardiac infarction.

No conclusion is offered from this series of cases beyond the fact that dicoumarin may be given safely to patients suffering from cardiac infarction, even when there is some degree of peripheral circulatory failure, so long as measures for the control of dosage are available. Protection against thrombo-embolism is of a high order, and the risks of the drug itself are small. In most cases a course of dicoumarin lasting for three weeks appears adequate, and the main contraindication to stopping administration at this period would be the presence of a condition in which deep breathing and leg exercises were not possible. The fact that it is not possible to start administration of an anticoagulant within the first few hours need not deter one from using a suitable drug at all, because the main period in which complications are to be anticipated is after the fifth day.

Discussion.

Certain important aspects of the problem of the use of anticoagulants in cardiac infarction have not received direct attention. For example, there is conflicting evidence as to whether or not anticoagulants can prevent infarction of the heart when they are given to experimental animals in whom a major branch of the coronary arteries is ligated. (Solandt and Best, 1938; Blumgart *et alii*, 1948). Such considerations scarcely apply to human subjects; the coronary arteries are grossly diseased, and it is known that in these cases a more effective collateral circulation is established between the main channels; but in any case, patients have usually noticed symptoms for some hours before a doctor examines them, so that death of the myocardium will almost certainly have taken place. Possibly the early use of anticoagulants will lead to a prevention of the spread of clot within the coronary vessels, and the likelihood of a second cardiac infarction in the convalescent period is reduced. However, this is not an important consideration, because actual coronary artery thrombosis is uncommon as a cause of the infarction.

A more important experimental finding of Blumgart *et alii* (1948) is that when dicoumarin is given to animals in which an infarct of the myocardium has been produced, there is no more hæmorrhage at the site of the dead muscle than in a control animal, and that the resultant scar is as well and as rapidly formed in both. The statement by Paterson (1938) that hæmorrhage into the intima of an atheromatous coronary artery might be an important cause of cardiac infarction requires mention, because it might form a valid contraindication to the use of anticoagulants. English and Willis (1943), in a careful review of the question, reject such a happening as a significant cause of myocardial infarction, and the workers of the Mayo Clinic have accepted their conclusions (Parker and Barker, 1947).

It is unlikely that any one person or group of doctors in this country will be able to gather together the number of cases essential for the full assessment of the value of anticoagulants in such a condition as cardiac infarction. The largest series so far considered is that of Wright in the United States of America, and the workers who took part in his nation-wide survey of the problem have put the use of these drugs on a firm basis from the clinical point of view. Such observations as can be offered in communications of this nature can help to emphasize only one or two small points in the problem; but it is hoped that three things have been presented in this paper with due emphasis: (i) that the numerous infarcts which are to be found in the lungs and other organs in fatal cases of cardiac infarction are more likely to be the result of the local arterial thrombosis than of embolism from mural thrombus; (ii) that these infarcts and other thrombotic sequelæ of cardiac infarction are an important factor in bringing about the death of such patients; (iii) that anticoagulants are indicated in the management of cardiac infarction in all cases, even after the lapse of several days.

Summary.

The use of anticoagulants in cases of cardiac infarction has been considered from the pathological angle. It has been found that in 47% of fatal cases, clot is present within the cavity of the heart. However, in very few of these cases is it possible to account for infarcts found in other organs on the grounds that they are the result of embolism from such a source of clot. It would appear that they are the result of local arterial thromboses.

The part that thrombo-embolic lesions play in producing a fatal outcome after cardiac infarction has been assessed. In about half of these cases benefit might be anticipated.

A small series of patients has been treated by the use of dicoumarin in addition to the usual methods currently employed. The only conclusions possible from 35 cases are that it is safe to use the drug in such cases when adequate control is possible, and that there are few thrombotic complications to be anticipated.

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RECTAL PROLAPSE.

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THE treatment in the majority of cases of rectal prolapse is gratifyingly successful. In most children and in approximately four out of five adults, however old and frail, the prolapse may be permanently cured by injections or by a single operation. Even the patients in whom recurrence eventually takes place usually have relief for several years and willingly submit to a further operation.

Various authors have tried to limit the term "prolapse of the rectum" to descent of the mucosa alone and to reserve the term "procidentia" for a complete descent of all coats of the rectum, whereas others have considered that both of these terms should be eliminated and the condition regarded as a hernia through the pelvic floor and its fascia. However, the term "prolapse" has been used for years for all degrees of descent of the rectum, and it has become too well established to be changed. In this paper the usual division of prolapse of the rectum into "partial" (in which the mucosa alone descends) and "complete" ("in which all coats of the bowel—the mucous, submucous, muscular and even the peritoneal—take part", Tuttle, 1903) will be followed.

Rectal prolapse occurs mainly in two well defined age groups: (i) in children between the ages of a few weeks and a few years; (ii) in adults after the third decade.

A few patients who have suffered from rectal prolapse since childhood wait till the third or fourth decade or even later before seeking treatment, and a few others give a history of a rectal prolapse which appeared to have been cured in childhood and which then did not recur till they reached middle-age.

Rectal prolapse occurs with equal frequency in the two sexes in children, but in adults it is nearly ten times as common in females as in males. If the patients are excluded who have had a prolapse in childhood, then complete prolapse occurs, on the average, about two decades earlier in males than in females—that is, in the fourth decade as compared with the sixth. A complete prolapse may occasionally appear following the birth of a child, or if preexisting, it may be aggravated by childbirth; but in other cases a rectal prolapse may be relieved during pregnancy. The increased frequency of its occurrence in females is in most cases due more to the construction of the female pelvic floor and to the existence of a mobile rectum than to the trauma of childbirth.

Complete rectal prolapse occurs most frequently in the mentally deficient, but this is not entirely due to the

excessive straining during defecation. The initiating factor may possibly be a congenital defect in the structure of the pelvic musculature, a deeper pouch of Douglas, general debility or weakness of all the tissues, or a relaxed sphincter due to neurological causes. By no means all patients who suffer from rectal prolapse are mentally deficient, although patients with a rectal prolapse may find it difficult to adapt themselves to normal social activities. Partial prolapse is rarely complained of by mentally deficient patients.

The diagnosis of rectal prolapse is not always obvious from the patient's history. Before operation it is advisable to try to determine whether the prolapse is partial or complete, and if it is complete, whether the anterior part of the prolapse contains peritoneum, bowel or vagina. It is important to note the direction in which the opening in the prolapsed portion of the bowel is pointing, for if a hernial sac is present then the opening will be directed backwards. If there is a hernial sac it will also be possible to detect "as distinct an impulse on coughing as with any other hernia" (Moschcowitz, 1912). Even if the prolapse has been in existence for many years, it may still affect only the mucosa.

As the adult patients who suffer from rectal prolapse are in the same age group as those suffering from carcinoma of the rectum, and as rectal prolapse and a discharge of blood and mucus may be the only signs and symptoms accompanying a carcinoma of the rectum, it is imperative that a complete sigmoidoscopic examination be carried out before a patient with a rectal prolapse is treated. This examination is also important in order that a benign tumour of the rectum is not overlooked, for it frequently happens that such a tumour is the original factor which initiated the prolapse. If such a tumour is overlooked the prolapse will be certain to recur after the operation. Similarly, other causes of straining, such as constipation, chronic bronchitis, prostatomegaly, urethral stricture, atresia of the external urinary meatus, phimosis *et cetera* should, when present, receive attention. Sigmoidoscopic examination is also necessary to exclude the presence of colitis or dysentery.

Prior to the commencement of treatment the state of the pelvic floor should be assessed. In many cases of rectal prolapse the musculature of the pelvic floor is so weak and deficient that a recurrence is certain no matter what treatment is tried. In some patients, in addition to the prolapse of the rectum, the whole perineum and both ischio-rectal fossæ bulge downwards on coughing and straining, and the condition resembles the so-called perineal hernia sometimes seen after an excision of the rectum. A neurological examination should always be carried out before a patient with a rectal prolapse is treated, especially if the anal canal is funnel-shaped and the sphincters are atonic.

Treatment of a rectal prolapse should be delayed if the prolapsed portion of the bowel is inflamed or if its vessels are thrombosed. Occasionally, when the prolapse is complete and irreducible and the tone of the sphincters is good, sloughing of the prolapsed portion of the bowel may occur.

The concept of rectal prolapse as a sliding hernia affecting mainly the anterior rectal wall we owe to Moschcowitz (1912), and this has been stressed by Graham (1942). When first examined, most patients with complete rectal prolapse have not progressed to this degree; instead, there is a circular descent through the anus of all coats of the rectum, and it does not contain vaginal wall or a hernial sac.

About a third of the patients with a complete rectal prolapse either have a poor resting tone in their anal sphincters or else have tone that is poor all the time. Even when an operation results in the cure of a complete prolapse, the anal sphincters may have been so dilated by the frequent or permanent descent of the rectum that it may be some time before they recover their tone; this should be explained to the patient before operation. In a few cases the long-standing dilatation of the anus results in permanent paralysis of the anal sphincters, and after the operation the anus remains patulous and the hoped for

improvement in the control over the bowel does not eventuate. In some other cases the permanent paralysis of the sphincters antedates the prolapse and is the cause rather than the result of it. These cases are generally neurological in origin. Occasionally, a complete rectal prolapse may be present while the anal sphincters retain their normal tone; but this is unusual and it occurs mainly in young patients.

Any treatment of rectal prolapse, partial or complete, should include attempts to improve the tone of the anal sphincter muscles by exercises and perhaps also by electrical stimulation; this point has been emphasized by Gabriel (1948a). The motions should be kept soft and the bowels regulated with a simple laxative such as milk of magnesia. The patient should avoid having more than one bowel action per day. The general condition should be improved, and any conditions productive of straining efforts should be treated. The patient should be persuaded to report regularly for examination so that a recurrence of the prolapse may be detected and treated in the early stages.

If a cystocele, uterine prolapse or rectocele coexists with the rectal prolapse, the rectal prolapse should be treated and cured first.

As in the treatment of carcinoma of the rectum, no one operation is suitable for use in all cases of complete rectal prolapse. The treatment employed in cases of rectal prolapse depends on whether the prolapse is partial or complete. In cases of complete prolapse it is believed that the treatment should be dependent on the general condition of the patient, on the presence or absence of a hernial sac on the anterior part of the prolapse, and on the length of the prolapse.

TREATMENT OF RECTAL PROLAPSE.

Some of the operations for the treatment of rectal prolapse are of historical interest only and are rarely employed, for after putting the patients to considerable discomfort and inconvenience, they are not often rewarded by a permanent cure of the disease. These procedures include the following.

1. Lockhart Mummery's procedure of tamponade of the presacral space. This operation may be followed by a postanal sinus which is slow to heal; but, what is more important, the fixation of the rectum obtained does not support the anterior rectal wall, and if the patient lives long enough any complete prolapse treated by this method will almost certainly recur. The same objection applies to Pemberton's procedure, in which an attempt is made to produce adhesions between the posterior rectal wall and the sacrum by means of an abdominal operation.

2. The Wreden-Stone (1929) operation. This consists of the insertion of two slings of thick silk or fascia, fixed at their outer ends to the *gluteus maximus* muscles near the ischial tuberosities and passing around the anus. These slings are arranged so that the lumen of the anal canal is narrowed, and a similar effect is obtained as with Thiersch's operation (Carrasco, 1934). However, the subcutaneous tissues of the buttock are opened during the insertion of the silk or fascial slings and infection may occur. So much scarring may follow such infection that the function of the anal sphincters may be seriously interfered with, and then the control over the bowels will become worse than before operation. If the slings are pulled too tight impaction of faeces may occur and regulation of the bowels becomes difficult. Theoretically the contraction of the glutei should keep the anus closed; but the patient is unable to maintain a continuous watch over the state of contraction of the glutei. Whether silk or fascia is used, these materials may stretch in time.

With some other procedures post-operative discomfort and complications are less, but there is little or no more freedom from recurrences. These also are now rarely employed. This group includes the following.

1. Linear diathermy coagulation of the anus (Van Buren). This is a relatively minor procedure and may, if required, be performed in the surgery or in the out-patient department. It is often productive of no more than

a slight temporary improvement, and it may produce no improvement at all. For this procedure to have a chance of being successful the cauterization should extend down to the subcutaneous external sphincter in at least one place.

2. Plication of the anal sphincters. This may be performed alone or in conjunction with another procedure, but in either case the plication is of very little value.

3. Sigmoidopexy. This is ineffective except for a short period. (A Paul-Mikulicz excision of the sigmoid colon with removal of as much of the colon as possible and followed by a colostomy closure is the most effective method of fixing the colon, but the indications for its use in the treatment of rectal prolapse are very limited.)

The Treatment of Rectal Prolapse in Childhood.

In some cases of rectal prolapse in children the condition clears up spontaneously if any predisposing causes such as phimosis, atresia of the external urinary meatus, vesical calculus, chronic bronchitis, constipation or diarrhoea are dealt with; therefore, these conditions should be attended to when present before other methods of treatment are attempted. Some children with rectal prolapse are in a debilitated condition, and attempts should be made to improve their condition while the prolapse is being treated.

In children the injection method of treatment gives satisfactory results with practically no complications, and it is rarely followed by a recurrence of the prolapse. A 5% solution of phenol in oil is often used, and under a general anaesthetic three millilitres are injected into the submucosa at three or four sites as high up the bowel as possible. One or more similar rings of injections are then made at a lower level in the bowel (Gabriel, 1948a).

These injections will usually cure the prolapse; but if it recurs the submucous injections of 5% solution of phenol in oil should be repeated and at the same time one to two millilitres of absolute alcohol may be injected into the perirectal tissues on each side of the rectum (Galbraith, 1931). It is very rare for rectal prolapse in a child to recur after a second series of injections, and this chance of recurrence will be lessened if prolonged efforts and a bad posture during defaecation are avoided.

The Treatment of Rectal Prolapse in Adults.

Injection Therapy.

In adults submucous and perirectal injections may relieve a partial or even a small complete rectal prolapse, but frequently the condition soon reappears.

Ligature Operation.

The ligature operation is the operation of choice for the treatment of partial prolapse in adults, but it is unsuitable for the treatment of complete rectal prolapse. This procedure consists typically of ligation and excision of three areas of mucosa and it resembles a hæmorrhoidectomy. If portion of the prolapse is too large for simple ligation, Goodsall's stitch may be employed. With this stitch the false pedicle of the prolapsed portion is divided into three parts. The ligatures on the three parts of the false pedicle may be inserted by means of a needle carrying a long doubled piece of catgut, and the ligatures should be tied so that they do not interlock. Sometimes it may be necessary to ligate the prolapsed portion in more than three parts. The doubled suture is then passed through the pedicle more than twice and it is divided as required.

Occasionally the wounds may be very slow to heal; but when the wounds have healed the result is frequently most satisfactory.

Recto-Sigmoidectomy.

Since Mikulicz (Moschowitz, 1912) described recto-sigmoidectomy in 1889, various other methods of amputation of the prolapsed portion of the bowel have been suggested (Bergeret, quoted by Carrasco, 1934; Miles, 1944); but Mikulicz's method is still used with considerable success, and it is probably superior to any of its modifications. The technique for recto-sigmoidectomy is

described and illustrated by Gabriel (1948a). This consists essentially of removal through the anus of the prolapsed portion of the bowel and of any redundant sigmoid colon. The peritoneal sac in the anterior part of the prolapse is also excised, after which the peritoneum is closed at a higher level.

An operation which removes the prolapsed portion of the bowel without treating the original cause of the prolapse should be unsound. Nevertheless, the results of this procedure are often very satisfactory, and it is believed that in experienced hands it is the operation of choice for most cases of complete prolapse of the rectum (Wilson, 1947).

Recto-sigmoidectomy is an operation which most patients, however frail or old, stand very well. Although the peritoneum is opened, this does not disturb the patient in the same way as would an abdominal exploration. The larger the prolapse, the more suitable is the patient for recto-sigmoidectomy, either alone or combined with another procedure, and the easier is the operation technically. The amount of bowel removed varies, but sometimes more than eighteen inches of redundant bowel may be removed.

The division of the outer portion of the bowel should be performed at and not above the ano-rectal ring; otherwise, when the bowel is reduced at the end of the operation, the suture line will be found to be higher in the bowel than was expected or intended.

After the peritoneal cavity has been opened and any redundant portion of the colon withdrawn, the peritoneum should be sutured to the bowel as high as possible. Although it is essential to remove all the slack colon, it is equally necessary to avoid pulling the colon down too far and removing too much of it. If the anastomosis is made under tension, this will inevitably be followed by separation of at least portion of the suture line.

Spinal anaesthesia is contraindicated, since the contraction of the bowel may preclude the removal of all the redundant portion. Even when, under general anaesthesia, as much of the colon as possible has been removed, a recurrence takes place in at least 20% of cases; when a recurrence does take place it may still be possible at a subsequent recto-sigmoidectomy operation to remove many more inches of what is again a lax colon. When the prolapse recurs there may be a redevelopment of the peritoneal pouch, and descent of portion of the vaginal wall in the anterior part of the prolapse may take place anew.

The bowels are confined for a week, after which a movement is obtained by the use of liquid paraffin and of glycerin suppositories. It is imperative that straining be avoided during convalescence. Whilst the patient remains in hospital digital examination of the rectum should be performed every few days to ensure that impaction of faeces is not developing; after the patient's discharge from hospital care should be taken to keep the motions soft. If impaction has been allowed to develop and has been relieved, the patient should take small but regular doses of liquid paraffin and should insert glycerin suppositories whenever the motions become too firm.

Complications of recto-sigmoidectomy can be irksome but are rarely dangerous. Opening of the peritoneum through an infected area often results in some peritoneal infection, and as a result there is, for a few days, almost always mild pyrexia and often tachycardia. A temperature chart which illustrates a typical reaction after a recto-sigmoidectomy is shown in Figure I.

In addition to the pyrexia and the tachycardia, post-operative nausea, vomiting and abdominal distension may develop after a recto-sigmoidectomy operation in which the pelvic peritoneum was opened, and these are undoubtedly also indicative of pelvic peritonitis. If the pelvic peritoneum is not opened these symptoms are usually absent. The pre-operative exhibition of succinylsulphathiazole or phthalylsulphathiazole may possibly help in reducing the severity of the infection of the pelvic peritoneum or of the pelvic cellular tissues after a recto-sigmoidectomy, but the evidence for this is not conclusive.

When difficulties are encountered during the course of the operation and persistent oozing occurs, the retrorectal space should be drained by a small piece of rubber inserted through the suture line. If haemostasis is not perfect, a haematoma may develop in the pelvis and may be the site of origin of a spreading cellulitis. Post-operative haemorrhage occurs but rarely after recto-sigmoidectomy, and then it follows separation of part of the suture line and the resulting infection.

Since the rectum is removed by a recto-sigmoidectomy, this procedure might be expected to be followed by frequency and precipitancy of the bowel actions; but fortunately this rarely happens unless the anal sphincters are weak or are permanently paralysed. Such frequency and precipitancy are due to the fact that the sigmoid colon is not so sensitive as the rectum to the presence

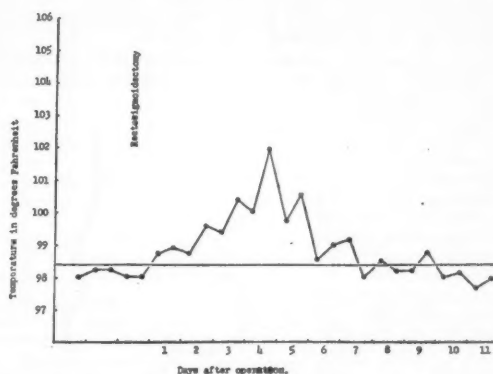


FIGURE I.

Temperature chart of a frail old woman, aged seventy-four years, who had suffered from a complete rectal prolapse for many years, and whose convalescence was satisfactory following a recto-sigmoidectomy at The Saint George Hospital, Sydney. During the operation the peritoneum was opened and 17 inches of bowel were removed.

of faeces in its lumen, and thus the patient is usually unaware of the state of fullness of the terminal portion of the bowel until the faeces have actually come in contact with the anal mucosa. When this happens the patient feels that he must empty his bowels immediately. (The excision of the rectum by an abdomino-anal procedure for the treatment of a carcinoma of the rectum more often results in such frequency and precipitancy of the bowel actions.)

Separation of the suture line is a frequent complication after recto-sigmoidectomy, but it is usually only of minor importance and often gives rise to no disability. The perirectal infection associated with such separation of the suture line is usually limited. Any pus that forms often drains into the lumen of the bowel, although occasionally it will track outwards and give rise to an external fistula. If the separation of the suture line is complete, secondary suture may be advisable, but this is not usual. Rarely, the perirectal infection is more severe and spreads to the pelvic cellular tissues, necessitating drainage and a colostomy. When healing occurs after separation of the suture line there is usually a wide-mouthed pocket communicating with the bowel; but this is no disability to the patient (Figure II). In some cases the granulation tissue may persist at the suture line till cauterized or removed.

Narrowing of the lumen of the bowel at the site of the suture line is a frequent complication after recto-sigmoidectomy. It is usually a sequel to separation of the suture line and of the resulting perirectal infection, and it may be weeks, months or years before it becomes obvious (Figure III). In some cases it is due to the method of suture of the bowel, and in these cases it

develops and becomes apparent soon after the operation. Narrowing of the lumen of the bowel during convalescence or later may result in impaction of faeces. If a stricture of the bowel develops it will usually respond to repeated dilatation, but occasionally proctotomy will also be necessary. A slight tightness at the site of the suture line is an advantage, as long as the lumen of the bowel remains sufficiently wide, so that there is no interference with the passage of faeces.

If the posterior vaginal wall is damaged during the operation a recto-vaginal fistula may develop.

After a recto-sigmoidectomy a colostomy may be needed when a recto-vaginal fistula develops or when severe spreading cellulitis is present. In these cases some difficulty is to be expected during the mobilization of the colon and in bringing it to the surface. When the condition for which the colostomy has been performed has subsided and the colostomy has been closed, then the added fixation of the colon to the abdominal wall may be a slight help in preventing a recurrence.

When a recurrence takes place after a recto-sigmoidectomy operation it may be a complete prolapse or it may involve only the mucosa. In the latter case submucous injections of phenol or ligation and excision of the mucosa should be tried; but it will usually be found that these are only temporarily effective and that the prolapse progresses and becomes complete. If recurrence of the prolapse has taken place, a second or subsequent recto-sigmoidectomy still has a good chance of producing a permanent cure. In some cases of recurrence after recto-sigmoidectomy in which the prolapsed section is short, another procedure such as the Moschcowitz procedure

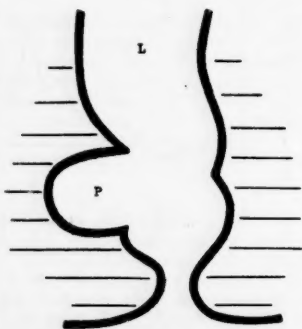


FIGURE II.

Diagram to show the wide-mouthed pocket in the bowel which may develop following separation of part of the suture line after recto-sigmoidectomy: L, lumen of the bowel; P, pocket.

(1912) may be used instead. In other cases, in which a recurrence has developed after recto-sigmoidectomy and in which there is a hernial sac of peritoneum in the anterior part of the prolapsed rectum, then in addition to the recto-sigmoidectomy either a Moschcowitz operation or suture of the adjacent edges of the levators and their fasciae is also advisable. The latter procedure may be performed by means of abdominal operation (Graham, 1942) or through the perineal wound. The main disadvantages of Graham's procedure are that it is more likely to be productive of shock than a purely perineal operation, and that the more severe the degree of the prolapse and the more important and necessary the repair, the thinner and poorer are the muscles and their fasciae likely to be.

Because of its very low mortality rate, because the recurrence rate (approximately 20%) is lower than that associated with other procedures, and because major post-operative complications are rare, recto-sigmoidectomy is the operation of choice in most cases of complete prolapse of the rectum.

Moschcowitz's Operation.

The Moschcowitz procedure (1912) consists of the elevation of the pelvic floor by a series of pursestring sutures of silk or linen, which are inserted in the pararectal and the recto-vesical or recto-uterine fossae of the peritoneum. These sutures obliterate any hernial sac in the anterior part of the prolapsed tissue, and they support and elevate the rectum. Thus the operation fulfils the conditions

necessary for the cure of severe degrees of rectal prolapse. However, this procedure has an appreciable mortality rate.

Moschcowitz's procedure may be combined with a recto-sigmoidectomy, a sigmoidopexy, a Paul-Mikulicz excision of the redundant colon, the insertion of fascial (Mayo) or silk slings (Lloyd-Davies) between the sacrospinous ligaments across the pelvic floor in front of the rectum, the insertion of sutures between the edges of the levator ani muscles and their fasciae, or the insertion of sutures in or between the lateral ligaments of the rectum. In the female during this or other abdominal procedures for the treatment of rectal prolapse the uterus should be fixed forwards so that retroversion and pressure on the anterior rectal wall do not subsequently occur.

Sufficient sutures should be inserted to raise the pelvic floor to the level of the cervix in the female or to an equivalent level in the male. During the operation the rectum should be held up straight, and care is necessary lest the lumen of the rectum be obstructed by the sutures.

The sutures should be tied firmly so that no peritoneal pouch remains in which a loop of bowel might become incarcerated. At the end of the operation a finger should be passed into the rectum to make sure that the lumen of the bowel is patent and adequate. It will be possible to palpate a ridge of peritoneum across the anterior aspect of the rectum, but this should not prevent the free passage of a finger.

After this operation some patients suffer from a temporary distension of the abdomen. Occasionally a loop of bowel may become adherent to the pelvic peritoneum, and as a result acute intestinal obstruction may ensue.

A recurrence of the prolapse after a Moschcowitz operation is not common; but when it does take place, and if it is again indicated, a Moschcowitz type of operation may be repeated.

Thiersch's Operation.

Thiersch's operation (Carrasco, 1934) consists in narrowing the lumen of the anal canal by a silver wire or other ligature placed in the perianal space. This operation was described in 1891, but it has been employed mainly for the treatment of incontinence of faeces (Gabriel, 1948b).

This operation has a place in the treatment of complete prolapse in patients who have no infective process in the region of the anus and who are too feeble or whose general condition is too poor to permit of a more extensive operation. It also has a place in the treatment of the patient with a complete rectal prolapse whose anal sphincters are weak or are paralysed, and who is incapable mentally of cooperating with the exercises necessary to strengthen the muscles of the anus.

In order to do away with the risk of infection around a buried foreign body, many European surgeons—for example, Bloch (Graham, 1947)—favour the procedure of Sarafoff of making a circular incision around the anus and then, by delaying the healing of the wound, producing a circular scar which narrows the anus. Thus a similar effect to that of Thiersch's operation is produced.

SUMMARY.

The problem of the treatment of rectal prolapse is discussed, and it is concluded that the best methods of

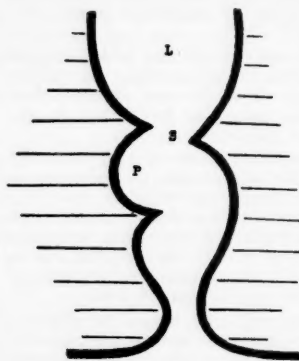


FIGURE III.

Diagram to show the pocket and stricture which may develop following separation of the whole or part of the suture line after recto-sigmoidectomy: L, lumen of the bowel; P, pocket; S, site of stricture.

treatment are as follows: (i) For children, the best measure is the giving of submucous injections of a 5% solution of phenol in oil. (ii) For adults with partial prolapse, a ligature operation is best. For adults with complete prolapse, and if the general condition of the patient is very good, a recto-sigmoidectomy is the best procedure; but if a recto-sigmoidectomy has been previously performed, either this may be repeated or Moschowitz's operation, Roscoe Graham's procedure or the insertion of silk slings across the pelvis may be employed. For adults with complete prolapse whose general condition is only fairly good, a recto-sigmoidectomy is best. For adults with complete prolapse whose general condition is very poor or whose mental state is such that cooperation with exercises to improve the poor tone of the anal sphincters is improbable, Thiersch's operation is best.

In all cases of rectal prolapse, any rectal or extrarectal causes of straining should also receive treatment, and energetic attempts should be made to improve the tone in the anal sphincters.

ACKNOWLEDGEMENT.

The foregoing remarks are based mainly on the treatment of patients with rectal prolapse observed at Saint Mark's Hospital and at other hospitals and clinics in England and North America during the tenure of a Gordon Craig Travelling Scholarship of the Royal Australasian College of Surgeons and partly on my own experience. My sincere thanks are especially due to the staff of Saint Mark's Hospital for the help and instruction that I received from them during my term as resident surgical officer.

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TREATMENT OF THE TREMOR-RIGIDITY SYNDROME (PARKINSON'S SYNDROME) WITH "DIPARCOL".

By W. LISTER REID,
 Sydney.

In 1947, Sigwald, Grossiord, Durel and Dumont reported the results of treatment in 168 cases of post-encephalitic and senile Parkinsonism with a new drug, diethylaminoethyl-N-thiodiphenylamine (2987 R.P.). This substance was prepared in connexion with research on anti-histaminics, but the results of treatment in this regard were disappointing. Sigwald was impressed by its ability to block the transmission of automatic impulses through the autonomic ganglionic system and by its atropine-like action. Because of this he decided to test it in a case of Parkinson's syndrome. As this patient showed considerable improvement the drug was tried in other cases. These workers claimed excellent results in 17%, good results in 33%, moderate results in 40%, slight response in 19%, and no appreciable difference in 6%.

This substance is now in production in England by May and Baker, Proprietary, Limited, and has received the name of "Diparcol". It is put up in the form of sugar-coated tablets in strengths of 0.05 gramme and 0.25 gramme. By courtesy of May and Baker I received sufficient quantities of this drug to test it on nine patients. I chose these patients to include four in whom the syndrome was mild and five in whom the syndrome was advanced.

After trying several variations in administration of this drug I found the following method to be the most satisfactory and the least liable to produce side effects. The drug is distributed over six doses per day and is taken with meals, so that the patient has breakfast, morning tea, lunch, afternoon tea, dinner and supper. A dose of 0.05 gramme is first given with breakfast and the dose is increased by 0.05 gramme per day, so that on the sixth day the patient is taking one small tablet with each of the six meals. Further increase is carried out in a similar manner until 40 small tablets, or 2.0 grammes, are being taken per day. When the patient is taking five small tablets per meal one large tablet (0.25 gramme) is substituted. All patients cannot tolerate this high dose. If evidence of intolerance presents itself, the dose can be increased every second or third day. If the patient still cannot tolerate the higher dose it is not wise to push it. In such a case one must be satisfied with a dose which is within the patient's tolerance. The patient is kept on the highest tolerated dose for about two weeks and then the dose is slowly reduced until a level is obtained below which the symptoms are aggravated and above which there is little or no improvement. This is regarded as the patient's optimum dose.

By increasing the dose slowly in this manner the occurrence of unpleasant side effects has been reduced to a minimum. In earlier stages with more rapid increase in dosage these unpleasant side effects were a frequent complaint.

Tolerance and Side Effects.

Certain side effects may be encountered with this drug and may necessitate a reduction in the dose or even complete abandonment. Lethargy is frequently encountered in the early stages, particularly in the afternoon. This symptom, however, usually disappears when the patient is completely stabilized. Patients occasionally complain of a sensation of dizziness, but true vertigo is exceptional, and this also passes off. *Grande malaise* is sometimes encountered when too high a dose is administered. The patient remains mentally alert, but he feels completely paralysed; the limbs feel heavy, as if made of lead. The patient may remain in this state of paralysis for an hour or so, being incapable of movement, and unless reassured may develop a state of great anxiety. Constipation is often complained of, and rarely transient urinary retention has been noticed. Rashes have been reported in a few instances, but they have usually disappeared without interruption of treatment. In rare cases blood dyscrasia has occurred necessitating discontinuing the administration, although this may be due to an intercurrent infection rather than to the action of the drug.

The above side effects, with the exception of the blood dyscrasia, apart from causing some anxiety, are of no great importance, as they tend to disappear as the patient becomes accustomed to the drug. It has been found that they usually follow a large dose or too rapid increase in the daily dose. Sometimes these symptoms may be offset by the administration of amphetamine sulphate or caffeine. In mild cases usually an optimum maintenance dose of 0.50 gramme daily is reached, and in moderate cases a maintenance dose of 0.75 gramme to 1.25 grammes daily. Even in severe cases it is rarely of value to exceed two grammes daily. The above is a more or less standard method of treatment, but each case should be judged on its own merits, and modifications should be made in the administration according to the patient's requirements.

Reports of Cases.

CASE I.—C.B., a male patient, aged thirty-four years, showed a mild example of the syndrome, confined to the

right arm and leg. His main disability was a fairly wide range tremor of the right hand and forearm, and to a less extent of the right foot, over the previous twelve months. He had some difficulty in carrying out fine movements, such as eating, dressing himself and writing. Only very slight masking of his facial expression was present and slight sialorrhoea.

One month after "Diparcol" treatment was started there was an improvement in the patient's condition. The excessive salivation had stopped, the sensation of stiffness had completely disappeared from his limbs, and he could now cut his own food and eat it well. His tremor was less rapid than previously, and at times at home it stopped completely. He had joined a cricket club and was able to play cricket and run. He can now walk normally and does not drag his foot. There was no further improvement when the dose was increased up to two grammes per day, and this dose was gradually reduced to find his optimum dose. As this patient has not reported further the present dose is not known.

CASE II.—H.B., a male patient, aged thirty-eight years, began to suffer from the condition about four years ago, with tremor in both hands and both legs occurring about the same time. This tremor had been slowly progressive, and eventually he had to discontinue his work because of the tremor. There was slight spasticity resulting in slowing of his general movements. He could carry out most movements with difficulty, although he had to be fed and was slow in chewing his food. There was some sialorrhoea, his speech tended to be slower and the facial expression had become masked. There was a slight tendency towards a flexed posture, particularly when he was walking, and some shortening of his steps.

"Diparcol" treatment was instituted, and two months later there was considerable improvement. He then had very little tremor, his movements were much freer, and he was generally more active about the house. He was able to go out frequently, whereas previously he had been somewhat of a recluse. The increased salivation had disappeared, and his face had more expression. He expressed the desire to return to some form of occupation; he discontinued the invalid pension and went back to work as a waterside worker on the docks.

CASE III.—A.L.H. was a male patient, aged forty-two years. This patient's condition began with slowing and stiffness of movement in his right hand about five years previously, and this had progressed only slightly and was also noticeable in his right leg. Tremor had begun in the left hand about two and a half years previously. This had progressed up to the point at which it constituted an annoyance. During the past year the tremor had also been present in his left arm. It was greatly exaggerated during moments of emotional stress. Apart from slight weakness of his right hand and some slurring of speech during periods of emotional stress, there was no other disability.

He was given "Diparcol", and the dose was gradually increased to 0.75 gramme per day. There was a considerable improvement in his condition at the time of his last visit, and he appeared to be without symptoms. In view of this fact there was no object in increasing the dose, and he was maintained on 0.75 gramme per day.

CASE IV.—A.W.J. was a male patient, aged fifty-two years. This patient's main trouble was tremor, which involved the right hand only and was pronounced. There was only very slight increase in tone of the muscles of the right upper extremity. The only other symptoms were fixation of expression, and a complaint of pain in the right forearm.

He responded very well to "Diparcol" therapy and his condition was eventually stabilized on 1.00 to 1.25 grammes per day. By this time the tremor had completely disappeared, except on rare occasions, his face was more expressive, and he had lost the pain in his forearm.

CASE V.—J.C. was a male patient, aged fifty-two years. In this case tremor had begun in the right forefinger eight years previously. It had slowly progressed until it involved all four extremities and was unusually pronounced. He had difficulty in performing fine movements, and he walked with a characteristic gait and a slight forward stoop. He presented a moderately advanced example of the syndrome.

There was some difficulty in stabilizing his condition on "Diparcol", as a large functional factor was present, and he complained of all sorts of queer side effects. However, his condition was eventually stabilized on 1.25 grammes per day, and considerable improvement of his condition took place. He can now walk normally, and when at rest at home he may go for several hours without tremor. He has returned to his occupation of dispensing in his pharmacy.

CASE VI.—J.B., a male patient, aged forty-nine years, presented an advanced example of the syndrome. He had a thirteen years' history of Parkinsonism without any previous illness. Tremor was present, although not particularly pronounced; but his greatest disability was due to spasticity, which was generalized. He was completely incapacitated, and had to be assisted by his wife and children in all respects, even to getting into and out of a chair.

This patient showed a pronounced and rapid improvement on "Diparcol" therapy. At the end of two weeks he was taking 0.75 gramme daily. Whereas previously he had been almost completely incapacitated, he was then able to carry out various actions for himself, such as using eating utensils, dressing himself and attending to his personal toilet; he could get into and out of a chair smartly, and there was a big improvement in his walking. He was then shaving himself for the first time in many years. Unfortunately this patient has not stuck to the routine, and periodically allowed his supply of tablets to run out, with a pronounced retrogression of his symptoms. He has not attended for some months now, but while he was under observation there was a considerable improvement in his condition.

CASE VII.—O.S., a male patient, aged fifty-six years, presented a fairly advanced example of the syndrome; I had carried out a right-sided resection of area 6 some time previously. He had moderately severe tremor in both hands, both legs and the lower jaw, and a moderate degree of rigidity. He was still able to carry out various fine movements slowly. This patient did not respond at all well to "Diparcol". He was unable to take more than 0.75 gramme per day without the occurrence of unpleasant side effects, and he frequently had to leave the tablets off altogether. Eventually "Diparcol" treatment was discontinued.

CASE VIII.—C.V.S., a female patient, aged thirty-five years, also presented a fairly advanced example of the syndrome, and I had resected area 6 on her left side about two years previously. Her tremor and spasticity were almost entirely confined to the right side, and her movements had become considerably slower.

There was considerable difficulty in stabilizing this patient's condition on "Diparcol". Eventually, however, it has been stabilized on 0.75 gramme per day, with considerable relief of her tremor and spasticity.

CASE IX.—J.A.B., a female patient, aged fifty-eight years, presented a fairly advanced example of the syndrome. She had considerable generalized rigidity and tremor of all four extremities, with complete masking of her face and much sialorrhoea. She was almost completely incapacitated and had to be assisted to carry out any action.

She was given "Diparcol", and her condition has eventually been stabilized on 1.25 grammes per day. There has been a pronounced improvement in her condition; her spasticity has practically disappeared and she has very little tremor. She can now do practically everything for herself, although slowly, such as eating, dressing herself and attending to her personal toilet, and she is able to take a two to three mile walk each day. The masking of her face is greatly relieved, and although it is still present to a certain degree there is plenty of expression in her face.

Discussion.

Although this is too small a series on which to base a definite conclusion or to allow one to talk about percentages, it does give some indication of the value of "Diparcol" as compared with other drugs previously used. Its beneficial effects vary with different patients; but it seems to afford relief, to varying degrees, to the majority of sufferers. It certainly presents a new line of attack with regard to drugs for this distressing condition, and from the inception of "Diparcol" other drugs are already in the process of manufacture and clinical trial. Although this treatment cannot be viewed in the light of a cure, it can be regarded as a control, and something which offers an atom of hope to those who are suffering with the tremor-rigidity syndrome.

In conclusion, I wish to offer my sincere thanks to May and Baker, Proprietary, Limited, for making available sufficient tablets to carry out the clinical trials.

Reference.

Sigwald, J., Grosslond, A., Durel, P., and Dumont, G. (1947), "Le traitement de la maladie de Parkinson et des manifestations extra pyramidales par le diéthylaminodihydro-N-thiodiphenylamine (2987 R.P.). Résultats d'une année d'application", *Revue neurologique*, Volume LXXIX, page 683.

Addendum.

Since the foregoing paper was written, a further 28 patients have been treated with "Diparcol". Good results have been obtained, in varying degrees, in 19 cases. Of the remaining nine patients, two have shown very little improvement but wish to continue taking the drug. The remaining seven have ceased taking the drug because of persistent side effects or lack of improvement.

One case in particular is worthy of mention, as this patient presents the best result we have obtained to date and the nearest return to normal.

The patient was a woman, aged forty-eight years, who reported that during the past three months she had gradually lost the power of her right arm and leg and had developed a fine tremor in the right hand. On examination, she had right spastic hemiparesis, and she walked with a slow spastic gait. The right arm was in a semi-flexed position and useless. Her face was void of expression and her speech was so slurred as to be almost unintelligible. In view of the possibility of an intracranial expanding lesion, she was admitted to hospital. However, this diagnosis was ruled out by investigation and she was given "Diparcol". She reported in five weeks and the result was really remarkable. Her gait was perfectly normal. Her right hand movements were apparently normal, as she had been able to knit and crochet three jumpers for her niece. Her facial expression was normal and her speech was rapid, concise and clear. This good result has been maintained.

EXPERIENCES WITH REFRIGERATION ANÆSTHESIA IN GENERAL PRACTICE.

By BERTRAND A. COOK,
Bulli, New South Wales.

For six years now I have been using freezing as treatment for large areas of traumatized tissue, mainly with a view to staying the position in severe accidents—"stalling", as it were, for time to resuscitate the patient pending the undertaking of radical surgical treatment. Every practitioner who has had in large hospitals experience of major accidents involving tearing and pulping of extensive areas of limbs must have seen in years gone by, and perhaps sees even still, some of the tragic results following operative interference undertaken before the patient was in a fit state to undergo major surgical procedures, despite blood transfusions and other restorative measures. Too often even surgeons of mature judgement have undertaken these operations, fearing that if they are delayed the patient's condition will deteriorate to such a degree as to render operation impossible. Another phobia is the tourniquet, the use of which is one of the great controversies in medicine. Most objections centre about three points: the local asphyxia of the tissues distal to the tourniquet, the damage to the tissues compressed by the tourniquet and the shock produced by the release of the tourniquet. Whilst there has been insufficient investigation to establish or refute these objections definitely, animal experiments show that bloodless extremities can survive for as long as fifteen hours at room temperature without necrosis, and Crossman and Allen and their co-workers report one badly ulcerated leg on which a tourniquet was left for six hours without damage, proved after amputation by pathological examination. But the tourniquet is necessary in a double sense—firstly, as a hæmostatic and, secondly, as a first step in introducing refrigeration anæsthesia. Without it the circulating blood in the extremity would prevent complete refrigeration. Serious systemic shock can be produced by the release of a tourniquet that has rendered large masses of tissue bloodless for a long time. The histotoxins that form in asphyxiated tissues during the usual time when a tourniquet is in place are insufficient to do this, but badly traumatized tissues that have impaired local resistance are an exception, and on them a tourniquet must be used guardedly, unless it is in conjunction with refrigeration. Reduced temperatures obviate all the objections to tourni-

quets, because the compressed or asphyxiated cells are at rest and not throwing off waste products. During the early days of refrigeration the tourniquet was applied four to six inches above the site of election, even in leg amputations. Now we know from experience that the level may be as high as eighteen inches above the site of amputation; but it is imperative that refrigeration be carried on for three or four inches above the tourniquet, and this has been my practice for a number of years. I outline here a routine I have developed for the treatment of these badly injured patients. Eleven serious accident casualties have been treated according to this plan, ten of whom survived not only the serious accident, but the ensuing necessary surgical procedures.

Technique.

When the patient is first examined a large dose of morphine (usually half a grain) is given, intravenously if necessary. The tourniquet is then reapplied. This is important, because in my experience tourniquets in lay hands are usually badly put on and often aggravate hæmorrhage, contributing further to shock. The patient is immediately transferred to hospital and refrigeration is commenced. I have no experience of machines for refrigeration in these cases, although I understand that they are used abroad for this purpose; I saw none in my recent visit overseas, and so I have in all cases relied on cracked ice. The damaged limb (or limbs) is then tightly packed in crushed ice, extending three or four inches above the level of the tourniquet. Formerly I added salt to the ice, but latterly I have not added salt, except for a patient now under treatment. In this case I thought quick freezing was necessary, owing to the patient's critical condition. A thermometer should be inserted down to the site of amputation and frequently checked. A temperature varying from 32° to 34° F. is satisfactory and not hard to maintain. The ice is maintained in position by means of water-proof sheets properly draped, the foot of the bed being lower than the head to favour drainage of melted ice away from the patient; a galvanized iron trough with a drainage pipe in the end, which I devised, may be used; but the water-proof sheets are usually reasonably satisfactory for the purpose. Ice is added as required and applied for as long as is thought advisable in the particular case. A period of five days is the longest during which I have applied refrigeration in any one case; but in several refrigeration has been applied for two and three days. Usually twenty-four to thirty-six hours should be ample time. When refrigeration has been begun, or even before if possible, other restorative methods are applied. Blood, if immediately available, is given at once; but if not, plasma is given until whole blood is available; also glucose and saline solution are given, or whatever other necessary measures are thought advisable are taken. It is a refinement, if time allows, to apply ice-bags to the skin at the tourniquet level, making sure no gaps are left uncovered, for an hour before applying ice. This produces a numbing effect and obviates unnecessary cramping due to the tourniquet. It is also useful, if the patient is accustomed to it, to give a good drink of whisky and repeat this in an hour and a half if thought advisable. This seems to allay apprehension and is very useful when no anæsthetic is to be given for the amputation. On this point I feel that, although most patients can be operated on without an anæsthetic—and I have done so in a number of cases—it is better, to avoid further psychic trauma, to employ light anæsthesia if possible. I am sure few of us would appreciate the sight of one of our own limbs being removed, however painlessly. Dispensing with the usual anæsthetic in these cases also has the following other disadvantages: (a) There is a hurry to complete the operation within the hour, which is the average effective time of refrigeration anæsthesia after removal of the ice. (b) The cleaning up of the worst of the gory mess has then to be carried out in the operating theatre; otherwise it can be done in the ward, if light anæsthesia is used. In some clinics the ice is reapplied post-operatively, and this would appear to be an advantage when the patient has been suffering from shock at the operation. The ice

is then gradually taken off over a period of days, but I have not found this practice essential in my cases.

Pre-operatively the results of freezing are usually pleasing. After two or three hours of freezing the patient should have little or no pain. The pulse rate gradually comes down and the colour improves. Although I am never in a hurry about operation, mostly waiting for at least twenty-four hours, I feel that as soon as the patient is safe for surgical treatment the operation should be undertaken for purposes of morale. On incision the muscles appear like a leg of meat that has hung in the butcher's freezing room for a day or so. The arteries are patent and bleed freely as soon as the tourniquet is released, showing absence of thrombosis. Eleven cases come into this review for the purpose of discussion, as follows: one of gangrene of the leg; one of partial avulsion of the left arm and left leg; one of compound dislocation of the left shoulder and tearing off of the left leg at the knee, with cerebral injuries and bowel trauma (this patient, the only one not surviving, died after seven days); three of badly mutilated legs; three of mutilated thighs; one of pulped right ankle and left foot. But it is sufficient to review six.

Reports of Cases.

CASE I.—Mrs. R., aged seventy-two years, a diabetic for eighteen years, had suffered for seven months with moist gangrene of the left leg. She had a great deal of pain, requiring several daily morphine injections, and besides she had severe toxic absorption symptoms. The limb was refrigerated for twenty-four hours and a supracondylar amputation of the left femur was performed without anaesthesia. Healing took place in twelve days, and the patient was discharged from hospital in three weeks.

A feature of this case was the cessation of pain and the improvement in the patient's general condition after the toxic absorption had been arrested after twenty-four hours of refrigeration.

CASE II.—F.W., aged thirty-two years, an engineer, was caught in winding gear, and suffered a fractured skull, compound dislocation of the left humerus, avulsion by torsion of the left leg to the knee and internal injuries with severe hæmorrhage and shock. His left femur was amputated without anaesthesia after three days' refrigeration. His condition improved for three days, but the patient died suddenly on the seventh day, probably from embolism.

CASE III.—Mrs. A.B., aged twenty-five years, a nurse, was run over by a train (incidentally on "V.E." Day), suffering partial severance of the left arm at the elbow and of the left leg at the knee; shock and hæmorrhage were profound. Refrigeration was continued for three days, and both limbs were amputated under light nitrous oxide and oxygen anaesthesia. She was discharged from hospital after eight weeks, and is now working and looking after two children of her own.

CASE IV.—M.S., a male patient, aged thirty-five years, was involved in a motor-cycle and motor-car accident, and sustained a rupture of the bladder, a rupture of the urethra, a compound fracture of the pubic rami and a pulped and crushed leg as far as the lower third of the femur. After forty-eight hours of refrigeration his condition improved enough for operation. At my request, Dr. A. Cameron Armstrong kindly undertook the amputation of the femur and the care of the pelvic fracture, whilst at the same time I repaired the bladder, urethra and bowel trauma. This patient made a good recovery from his ordeal, but is still having treatment by a urologist.

CASE V.—M.O'K., a male patient, aged twenty-three years, a railway clerk, was run over by a train in the shunting yards. The right foot was severed at the metatarsophalangeal joints, and the left foot pulped to the ankle. Shock and hæmorrhage were severe, and the operative procedures, after thirty-six hours' refrigeration, were an amputation at the right mid-tarsal line, and amputation of the left ankle through the joint, the heel being used as a padded flap. Recovery was uneventful, and the patient can walk without crutches and also dances frequently.

CASE VI.—E.L., a male patient, aged thirty-three years, was injured when a sling of steel ingots crushed his left leg as far as the lower third of the femur. The limb was refrigerated for twenty-four hours, and amputation was performed at the middle and lower third of the right femur. This patient, incidentally, had a secondary hæmorrhage after two days, requiring reopening of the wound. This patient has returned to work.

Summary and Conclusions.

1. Refrigeration anaesthesia is advocated for severely traumatized patients suffering from severe shock and hæmorrhage. This is not necessarily only for its anaesthetic effects *per se*, but also (and primarily in my hands) because it provides means of allaying the effects of the trauma, whether by histotoxins or by other toxins, as in the case of gangrene, and of gaining valuable time for resuscitation, pending the undertaking of surgical repair of the damage. The procedure can be confidently recommended to general practitioners, especially in country districts, who are called upon to treat badly injured patients. A few simple precautions regarding technique and resuscitation should give, in most cases, a favourable result in average skilled hands. I also think (although I have not used it for this purpose) that refrigeration could be used when it was thought advisable to transfer patients for long distances by ambulance for treatment by surgeon specialists.

2. Brief notes are given of six out of eleven patients treated by refrigeration anaesthesia, as showing typical results to be expected from this line of treatment.

THE ROLE OF THE SUBSCAPULARIS MUSCLE IN THE STABILITY OF THE SHOULDER JOINT, AND THE MAGNUSON OPERATION.¹

By JOHN JENS,
Melbourne.

THE problems of the role of the subscapularis muscle in the stability of the shoulder joint have been recently aired in the magnificent symposium contained in the initial British issue of *The Journal of Bone and Joint Surgery*. The pathology and treatment of instability of the shoulder have not, as the varying articles indicate, been finally established, and whilst one hesitates to pour more fuel onto an already overcrowded fire, there are relevant points which have so far escaped general attention.

In dealing with the pareses of the after-effects of poliomyelitis, the remarkable stabilizing effect of the shoulder-girdle muscles on the shoulder joint is a notable feature, more particularly if a comparison is made with a similar condition of the hip joint, where the anatomical make-up allows an intrinsic stability which is not affected by muscle weakness. Further, the important role of the functioning subscapularis muscle as a stabilizer is shown conclusively in those cases in which the internal and external rotators of the shoulder are involved. In these, the head of the humerus can be moved passively in and out of the glenoid cavity, and furthermore, passive external rotation, or extension, or both, will displace the humerus anteriorly from its socket.

The Mechanical Anatomy of the Shoulder Joint.

The anatomy of the subscapularis muscle is sufficiently established, to quote Gray and Cunningham, who both indicate that it arises from the concavity of the anterior surface of the scapula, and inserts (i) by a converging tendon running upwards and outwards into the lesser tubercle of the humerus and by fleshy fibres into the surgical neck below this, and for approximately one inch of the body in a vertical line down from the tubercle, and (ii) again into the anterior capsule, by which means it becomes an inherent part of the musculo-tendinous cuff of the shoulder joint (Figure 1). This means that the tendon passes directly in front of the shoulder joint, where it forms an active muscle buttress. This buttressing effect is further enhanced by the intrinsic muscular contraction, which has the effect of forcing the head of the humerus into the glenoid cavity.

Lastly, the subscapularis greatly enhances the supporting effect of the anterior capsule itself, and through

¹Read at the annual meeting of the Australian Orthopaedic Association, Perth, August, 1948.

this capsule is in direct continuity with the posterior portion of the musculo-tendinous cuff, and therefore with the external rotators on the greater tubercle.

Next, it should be noted that the relative size of the shallow glenoid cavity, even with its important cartilaginous rim, is in no wise great enough to enable it to contain the relatively large humeral head with any stability, and that alterations in the outline of the articular surfaces must alter the joint mechanics. Again, the forward tilt of the scapula in the coronal plane is a weakness in its mechanical make-up. It is to these basic factors, then, that we look for a functioning strong shoulder, and a breakdown in one or more may lead to a recurrent instability. Summarized, these factors are: (i) the size and shape of the humeral head, (ii) the size and shape of the glenoid fossa, (iii) the ring of the *labrum glenoidale*, and (iv) the anterior muscle buttress.

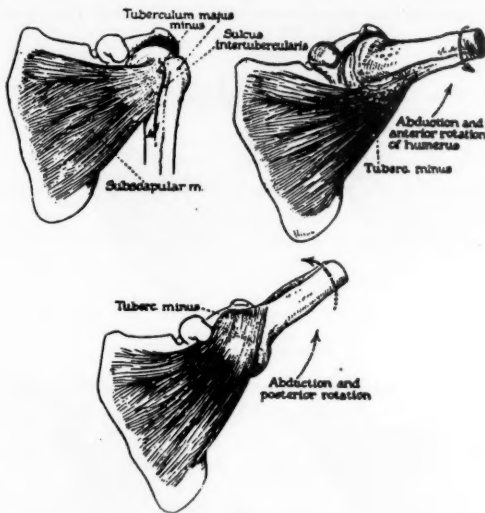


FIGURE I.

Attachment of subscapularis to lesser tuberosity of humerus. (From Magnuson and Stack, 1943.)

Pathology.

1. The importance of the shape of the humeral head has been emphasized by Hill and Sacks, whose demonstrations of the abnormal postero-lateral groove have shown that it is a cause of recurrent dislocation *per se* or in combination with the other factors mentioned, provided that sufficient external rotation is possible to allow the groove to engage the anterior lip of the glenoid. Whether the groove is a traumatic or congenital defect is immaterial.

2. The size and shape of the glenoid fossa are important. Gallie has noted developmental defects of the fossa in his Moynihan Lecture (1947). He points out that it may be wide and flat, or long and narrow with a flattened straight anterior margin, and again that the head of the humerus may be disproportionately large.

3. It is around the glenoid labrum, a comparatively small factor, that the storm of discussion on this subject centres; but there is sufficient evidence by the most competent of surgeons to allow it to be stated irrevocably that the Bankhart lesion is not present in all cases, and therefore is not the *sine qua non* of the recurrent dislocation. It is interesting to note that Grant (quoted by Gallie) has found indications of congenital defects in the attachment of the labrum to the glenoid margin. A discussion on the pros and cons of a Bankhart repair operation in all cases is immaterial, for since there are other basic causes, the operation as a treatment for these must lapse.

4. The effect of absence of the anterior muscle buttress (Figure II) due to paresis has already been noted; but

even in this factor congenital structural deficiencies have their influence, and Magnuson has described variations in the shape and insertion of the subscapularis fan, which varies from the broad muscular insertion extending well down the shaft of the humerus to the narrow converging tendon which fixes itself to the summit of the lesser tubercle. In two of the cases to be discussed, this feature was present, and in one of these the connexion with the musculo-tendinous capsule was indefinite.

The Operation.

For the operation two assistants are required, one to control the arm, and one to effect internal and external rotation as desired. A small flat sandbag should be inserted under the blade of the scapula concerned to push it well forward. The incision runs down from the anterior part

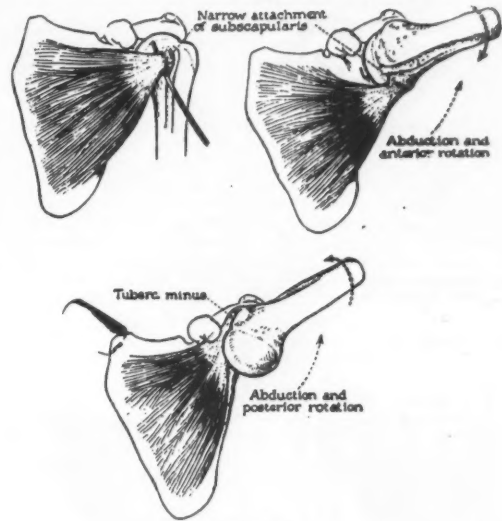


FIGURE II.

Tendon slipping between head of humerus and coracoid when arm is placed in abduction and extension. (From Magnuson and Stack, 1943.)

of the acromio-clavicular joint, parallel with the deltoid fibres, for four inches or five inches. The deltoid is split immediately lateral to the delto-pectoral groove to avoid damage to the cephalic vein, and the subscapularis muscle is exposed by retraction. External rotation will bring the lesser tubercle into the floor of the wound. In most cases a clear definition of the actual extent of the muscle is difficult initially, and can be facilitated by slipping a blunt dissector under the full width of the muscle from below upwards, and as far laterally as possible. By traction on this, the capsular insertion is brought into relief. The upper and lower margins are then dissected free, and the capsule is incised, along the upper aspect of the muscle (Figure III). Whilst this is being done, care should be taken to avoid the intra-articular portion of the long head of the biceps—the sharp angle it makes as it enters the joint brings it perilously close to this area. The lower margin is cleared, and the tendon insertion is cut through just medial to the bicipital groove. The freed muscle may be lifted medially and dissected further back if the surgeon desires to expose the joint cavity for evidence of a pathological defect. The arm is now internally rotated so that the greater tuberosity is brought into the field, and the site for the new insertion of the tendon is chosen. This site depends on two factors. In the horizontal plane it is prescribed by the fact that external rotation should be limited by approximately 50% of normal. In the vertical plane, the insertion may have to be lowered as much as half an inch to three-quarters of an inch to effect the buttress action across the front of

the joint. The periosteum is raised at the established site, and the tendon is fixed to this area by two or three staples. It is important that the spread of the muscle be preserved, and therefore the lower margin should be fixed down either with a small staple or by multiple thread sutures of number 40 cotton. Finally, a few closing sutures shut the capsule above. There should be, at the conclusion of the operation, approximately 50% limitation of external rotation. The humerus should be rotated to see that it is being held in position by the tendon and the lateral part of the subscapularis muscle, in both internal and external rotation, and the reconstructed capsule should be a continuous sheet surrounding the humeral head (Figure IV). Post-operatively, the arm is fixed to the side by strapping for a period of four weeks. After this, pendulum exercises are

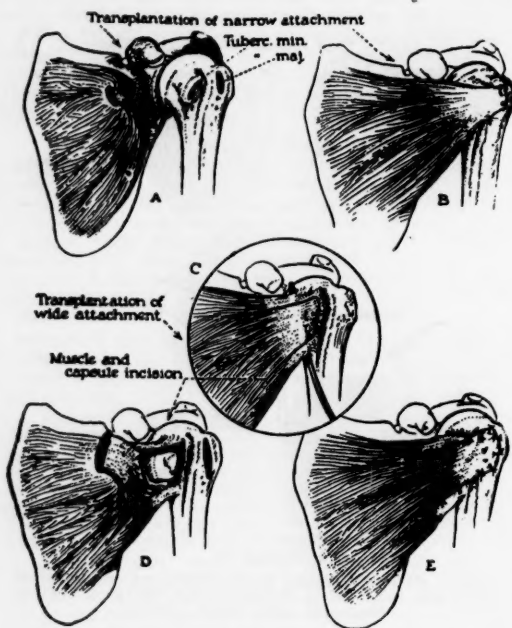


FIGURE III.

Medial reflection of tendinous attachment and exposure of head of humerus. (From Magnuson and Stack, 1943.)

permitted daily for two weeks, during which time the arm is kept in a sling, then active abduction and external rotation are allowed. A further two to three weeks' physiotherapy is required after this.

The operation as devised by Magnuson and Stack requires the removal of a bone block of lesser tubercle from the point of insertion of the subscapularis and the preparation of a bed for it and the attached tendon on the greater tuberosity. I find there are two objections to this: (i) it is difficult to avoid the removal of some of the articular surface; (ii) the graft is likely to form a bulky callus which will interfere with normal abduction. These difficulties are overcome by detachment of the tendon from its insertion and by fixation in its new bed by serrated staples. In a personal communication, Stack has stated that they have used the bone block because they feel that the cancellous bone heals readily and gives a strong attachment, which they claim will be stronger than tendon alone. They have further reinforced the fixation by a small ivory peg.

The only other author to discuss this operation, Giannestias, also detaches the tendon and fixes it to a bone slot with braided silk. The facility afforded by the staple procedure is obvious.

In those cases in which the muscle bulk is large and the insertion wide, it is reasonable to raise a window of the

tendon, casement fashion, and bring this across for fixation.

The similarity of principle to the Putti-Platt procedure will be seen. Here the tendon is shortened by a lateral plication with a double fold over the anterior joint surface. In reviewing this particular operation Osmond Clarke makes the following statement: "It is clear that the operations which achieve the most consistent success are those which produce a block to the exit of the head in front." It is claimed that the Magnuson procedure effects this block and that it is a functioning physiological block. The benefit of the operation lies chiefly in the fact that it is not designed to cover any one of the several basic causes of recurring dislocation of the shoulder.

Analysis of Cases.

Eleven patients have been operated upon. Eight cases are considered suitable, from the point of view of time and records, for this discussion. In all cases the operation

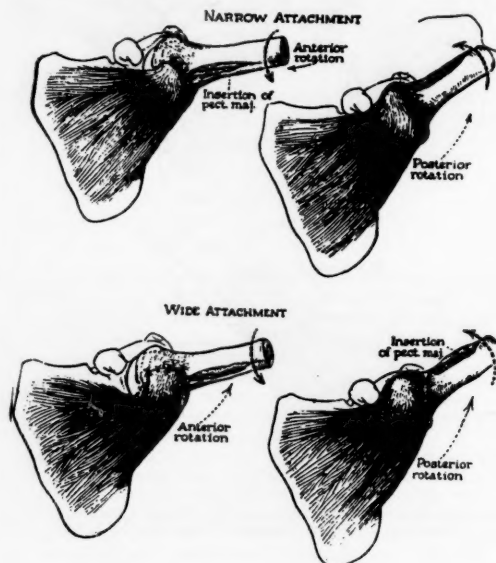


FIGURE IV.

Method of attachment of muscle and tendon under head of humerus. (From Magnuson and Stack, 1943.)

was performed over twelve months ago. There have been no recurrences, and all patients are doing ordinary heavy physical work. One man on whom a Bankhart operation had failed previously is doing overhead work as a telegraph linesman. Another, who had undergone an unsuccessful modified Nicola operation, is working as a railway ganger.

Movement.

The chief deficiency of function is in external rotation, which varies from 50% to 80% of normal. In all cases, abduction and hyperabduction in either internal or external rotation were both as full as on the normal side. Extension, flexion and adduction were in no wise limited.

Pain.

All patients complained of an aching, rheumatism-like pain in the joint in the months immediately following the operation, but in only one instance has this been prolonged and severe enough to produce any incapacity.

Summary.

1. The part played by the subscapularis muscle in the stability of the shoulder joint is indicated.
2. A modification of the Magnuson operation for recurrent dislocation is described.

3. The operation has the benefit of covering all the known pathological causes of recurrent dislocation.

4. It is a simple procedure to perform, which is one of its more appealing assets.

5. It leaves a good functional range of movement for the shoulder joint.

Conclusion.

I realize that this is a small series of cases for presentation, but being convinced of the soundness of the basic principles involved and impressed by the highly satisfactory results so far reported, I consider that the matter is worthy of notice.

References.

Magnuson, P., and Stack, J. K. (1943), "Recurrent Dislocation of the Shoulder", *The Journal of the American Medical Association*, Volume CXXIII, page 885.

Reports of Cases.

TYPHOID FEVER: TWO CASES TREATED WITH CHLORAMPHENICOL.¹

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SINCE the original observation by Woodward *et alii* (1948) that Malayan patients with typhoid fever responded favourably to chloramphenicol, confirmatory reports of its value have been published both in England and in America (Bradley, 1949; Murgatroyd, 1949; Foster and Condon, 1949).

As limited supplies of this useful antibiotic are now available in Australia, it is thought that the following two case histories of typhoid patients treated with chloramphenicol will be of interest.

Case I.

M.K., a trainee nurse, aged twenty-one years, was admitted to Townsville General Hospital on July 30, 1949. For the last three days she had felt feverish with headache and pain in the legs. On examination of the patient her temperature was 39.4° C. (103° F.), but no other abnormality was noted. Two days later, her temperature reached 41.1° C. (106° F.) still with no obvious physical signs, and a leucocyte count revealed 6700 leucocytes per cubic millimetre of blood. The patient was given "reduction sponges" and penicillin (50,000 units at once, thence 20,000 units every three hours). The illness was symptomless until August 4, when the patient had mild diarrhoea, and it was noted that her tongue was furred. Penicillin therapy was stopped and a provisional diagnosis of paratyphoid fever was made. On August 4 a blood count showed 7000 leucocytes per cubic millimetre, of which 70% were neutrophils, 27% were lymphocytes and 2% were monocytes.

For the next five days the patient's temperature was still high, ranging between 38.9° C. (102° F.) and 40.5° C. (105° F.), the tongue remained coated, and it was noted that the abdomen was tender on palpation. The provisional diagnosis was altered to typhoid fever. On August 10 the bowels acted four times and the stools were loose and yellow. The patient was now delirious at times, her face was becoming thin and pinched, and the pulse was rapid and weak. The abdomen was slightly distended and still tender. Diarrhoea continued, the stools being loose or fluid in consistency. On August 8 the fourteenth day after onset, the patient's serum agglutinated a suspension of *Salmonella*

typhi in a dilution of 1:320. On August 10 *Salmonella typhi* was cultivated from a sample of patient's blood taken five days earlier, the diagnosis being thereby established. In addition, *Salmonella typhi* was isolated from a specimen of faeces passed on August 10.

On the evening of August 11, the fourteenth day of the illness, a course of chloramphenicol ("Chloromycetin"—Parke, Davis) was commenced, the initial dose being four grammes by mouth, followed by 0.5 gramme every four hours for four days, then 0.25 gramme every four hours. The last dose was given on August 19. The total amount administered was 22 grammes. On August 13 it was observed that the patient looked much brighter. Delirium had ceased although her temperature was still fairly high. Next day the patient said that she felt well, though her pulse was still rapid and the skin hot. On August 15, the fourth day after the commencement of treatment, there was considerable improvement. The abdomen was much less tender and her temperature was becoming normal. Blood taken for culture on August 16 remained sterile. On August 18 the patient looked perfectly well, and her temperature had been normal for more than two days.

The patient's clinical improvement was maintained though *Salmonella typhi* was again isolated from specimens of faeces taken on August 16, 24 and 30, which indicated that infection was still present in spite of treatment. By the end of August the patient was up and walking about; but on September 2 she suddenly felt hot, and headache and backache developed. Her temperature rose to 39.8° C. (103.6° F.), and there was tenderness on palpation of the left iliac fossa (the menses were due). The following day, it was apparent that the patient had a relapse, and a close watch was kept for signs of haemorrhage or perforation. The patient's general condition was satisfactory, but she did not look well. On September 5 the blood contained *Salmonella typhi*. On September 6 *Salmonella typhi* was present in the faeces and for the first time was isolated from the urine. Another course of chloramphenicol was commenced on September 6, the initial dose being four grammes, followed by 0.5 gramme every four hours until September 9, thereafter 0.25 gramme every four hours until September 12—a total dose of 20 grammes. The temperature subsided within twenty-four hours, and did not rise again. The patient's headache disappeared rapidly and she felt well in less than twelve hours. Culture of urine and faeces failed to grow *Salmonella typhi* after the second course of the drug. The patient made steady progress and was finally discharged from hospital on October 4. The relevant portions of the temperature chart are reproduced in Figures 1A and 1B.

Case II.

R.J.S., a male patient, aged twenty-one years, was admitted to the Brisbane General Hospital on August 16, 1949, as a typhoid fever suspect. The patient's younger brother had already been admitted to hospital on July 27, 1949, the diagnosis of typhoid fever in his case being established by the obtaining of a culture of *Salmonella typhi* from his stools and by the discovery that his serum agglutinated a suspension of *Salmonella typhi*.

Two weeks before his admission to hospital, the patient (R.J.S.) had developed central abdominal pain and severe headache. For about a week he had been feverish, and had had several attacks of shivering. The patient was a well-built young man, and the only abnormality noted on examination was slight tenderness below the umbilicus. His spleen was not palpable. His temperature was 39° C. (102° F.) and his pulse rate was 88 per minute. On August 18 papules which resembled "rose spots" were noted on the chest and back, the patient complained of colicky abdominal pain and constant dull headache, and the maximum temperature then exceeded 40° C. (104° F.). No pathogens were grown from a specimen of faeces submitted on August 17, and throughout his illness *Salmonella typhi* could not be cultivated from either blood or faeces. On August 17 the patient's serum agglutinated a suspension of *Salmonella typhi* in a dilution of 1 in 40 ("H" suspension) and 1 in 20 ("O" suspension). On this day, too, a blood count showed 10,600 leucocytes per cubic millimetre, of which 33% were lymphocytes, and the blood

¹ "Chloromycetin" (Parke, Davis).

contained 13.7 grammes of hæmoglobin per 100 millilitres. By August 24 the patient was very delirious at times, his pulse was dicrotic and his temperature was constantly about 39.4° C. (103° F.); his headache was more pronounced and he was passing each day two or three loose stools containing blood and mucus. The abdomen was now rather distended and crops of rose spots appeared. Two days later he developed a harsh, dry cough, but no physical signs were detected in the lungs.

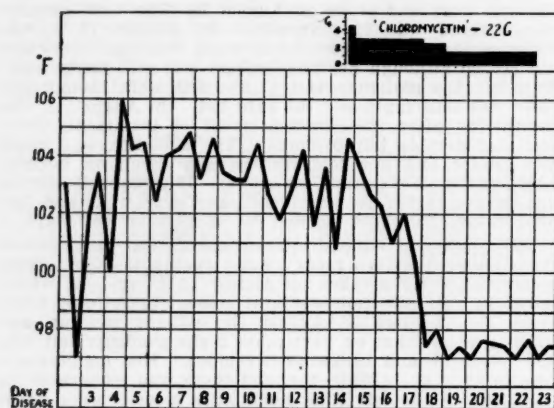


FIGURE 1A.

Temperature chart of patient M.K. (Case I), third to twenty-third day.

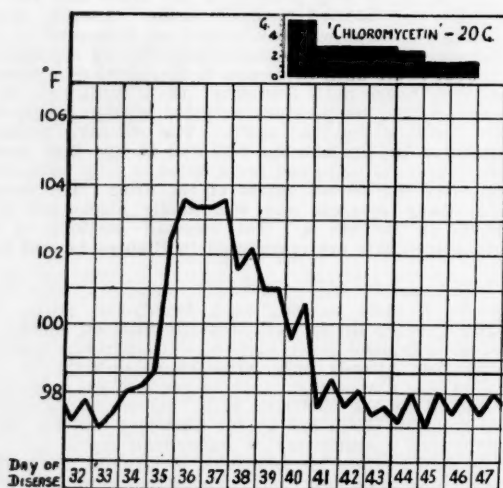


FIGURE 1B.

Temperature chart of patient M.K. (Case I), thirty-second to forty-seventh day.

On August 30, the twenty-eighth day after onset, the patient was in a very toxic state. He was delirious and showed *subtilus tendinum*, and fresh rose spots were still appearing. His motions contained blood and sloughs of mucous membrane. A blood count showed 6800 leucocytes per cubic millimetre, of which 41% were lymphocytes.

As the patient's condition was so toxic and the clinical and epidemiological evidence indicated typhoid fever despite the failure to grow *Salmonella typhi*, it was decided to commence treatment with chloramphenicol on August 30. The dose was three grammes at once, followed by 0.5 gramme every four hours until September 2, when

0.25 gramme was given every two hours until September 5, a total of 18 grammes being administered by mouth. Within twenty-four hours of taking chloramphenicol the patient became rational and said that he felt much better, although his abdomen was still distended and his temperature rose to 38.9° C. (102° F.). However, by September 4 the temperature had settled, and the patient looked much improved, his toxæmia and rose spots having disappeared. His temperature remained normal, except for two short periods when it rose to 38° C. (100.4° F.), until the patient was discharged from hospital on September 28. On September 7 the patient's serum agglutinated *Salmonella typhi* in a dilution of 1:80 ("O" suspension) and 1:5280 ("H" suspension).

The relevant portion of this patient's temperature chart is reproduced in Figure II.

Comment.

Both of these patients were in a toxic state, and chloramphenicol had a highly beneficial effect, especially in Case I. Subjective improvement was evident in each within forty-eight hours, but the temperature declined more slowly. This is in contrast to the quick response of patients with rickettsial diseases after administration of chloramphenicol.

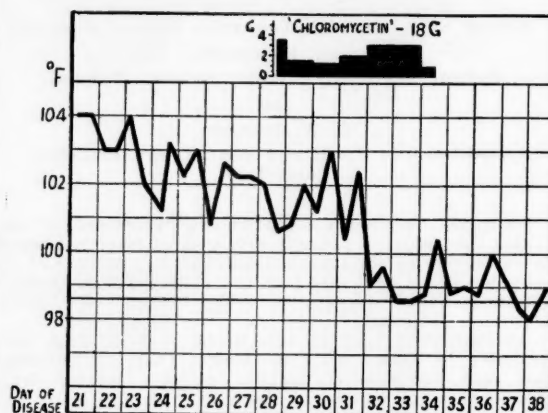


FIGURE II.

Temperature chart of patient R.J.S. (Case II).

In Case I relapse occurred. In their original publication Woodward *et alii* (1948) remarked that two out of ten patients showed evidence of relapse after treatment with chloramphenicol, though the infecting organism did not develop resistance. Since these patients were treated we have seen the article by Smadel, Woodward and Bailey (1949), in which the authors point out that relapses are common in typhoid patients treated with chloramphenicol, although they respond well to a second course of the drug. These observers, who have had considerable experience with chloramphenicol, now recommend that "adequate amounts should be administered for more than eight days to patients acutely ill with typhoid if relapses are to be avoided". They recommend an initial dose of three to four grammes of chloramphenicol, followed by one to three grammes daily in divided doses. This would give a total dosage of 14 to 34 grammes. Nineteen patients treated for nine to fourteen days without relapse averaged 25.7 grammes. It therefore appears that the initial course of 22 grammes given to this patient was inadequate, because she continued to excrete typhoid bacilli. Perhaps it would be wise to give more chloramphenicol without waiting for a relapse if bacteriological tests show that *Salmonella typhi* is still present in the faeces or urine after the initial course.

As to Case II, the temperature chart alone might seem to indicate that defervescence was already beginning when

the drug was administered. Clinically the patient was then in his most toxic state. The rapid subsidence of toxæmia after he received chloramphenicol leaves little room for doubt that it was responsible for the patient's improvement.

These two case histories provide further evidence of the great value of chloramphenicol in the treatment of acute typhoid. Dosage should be adjusted to suit each patient, but the initial course should be of at least eight days' duration.

Acknowledgements.

Acknowledgements are due to the Director-General of Health and Medical Services, Queensland, for permission to publish this report, and to the General Medical Superintendent, Brisbane General Hospital, for permission to publish the clinical history of Case II.

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 Woodward, T. E., Smadel, J. E., Ley, H. L., junior, Green, R., and Mankikar, D. S. (1948), "Beneficial Effect of Chloromycetin in the Treatment of Typhoid Fever", *Annals of Internal Medicine*, Volume XXIX, page 131.

Addendum.

Since this report was written, six additional patients suffering from typhoid fever have been treated in public hospitals in Queensland. Treatment was continued for eight days. All patients responded rapidly; none relapsed.

Reviews.

GYNÆCOLOGICAL PATHOLOGY.

THE essentials of gynecological pathology are certainly adequately covered in the second edition of Faulkner and Douglass's "Essentials of Obstetrical and Gynecological Pathology".¹

The basis of sound clinical obstetrics and gynecology is the pathology of their various conditions. This is becoming recognized to an increasing extent and emphasized in examinations for higher qualifications such as the M.R.C.O.G. and the F.R.A.C.S. A pass cannot be obtained without an adequate knowledge of pathology, and as greater numbers are sitting for these examinations each year, this volume comes at a propitious time. To them it is strongly recommended. But practitioners, specialists and gynecologists, who have long left behind their medical schools, will find here an adequate basis for many truisms which have become to them almost empirical.

This book is well set out, with clear type and excellent illustrations. The interpretation of photomicrographs might be easier if their magnifications were given. These are omitted throughout.

A notable omission is any explanation of the diagnosis of carcinoma by the vaginal smear method. This is dismissed in a couple of lines.

The photomicrographs of the monthly changes in the endometrium are excellent, but no emphasis is laid on the relationship of non-secretory premenstrual endometrium to anovular cycles and their importance in sterility investigations. One chapter is entirely devoted to endometriosis. This important subject is dealt with particularly well. There are adequate photomicrographs and the symptomatology is correlated clinically in a praiseworthy manner.

As in other books with a similar title, there is no description of the morbid anatomy of the toxæmias of pregnancy

or of the puerperal and post-abortion infections. This is all the more regrettable, as the only chapter on obstetrical pathology, namely, that on the placenta, is accurate and comprehensive.

Some of the photomicrographs are of relatively common lesions such as Walthard cell rests, decidual reaction in endometriosis and needle-like spaces left by cholesterol crystals in the neighbourhood of ovarian lesions, rarely or poorly illustrated elsewhere and so of great value, particularly to the type of student for whom this book has been written.

Including the normal histology at the beginning of the book and elaborating it throughout various chapters is a very sound and helpful practice.

Preservation or more appropriately non-mutilation of surgical specimens is discussed in the opening chapter and these remarks should be read and taken to heart by all operators.

It is unfortunate that short lists of references, at least to the more noteworthy original articles, are not included at the end of each chapter; the reason offered in the preface for this omission is no excuse.

Another criticism, this time of the text itself, is a tendency for the authors to be indecisive in their discussion of what are often referred to as borderline malignant tumours of the endometrium and chorion. Undoubtedly there is a very occasional instance in which such indecision must persist, even after careful consideration of the pathological and clinical features, but it is only the exceptional case in which such vacillation is justified.

In conclusion, this book can be thoroughly recommended, especially as there is an appreciation of the normal physiological variations in the pelvic organs. It is worth buying to look at the illustrations alone. Each one is a clear photograph with an adequate explanation immediately below. A glance through these is in itself a complete revision course in the whole field of gynecological pathology.

EPILEPSY IN CHILDREN.

AN excellent book by Edward M. Bridge¹ is based on work with 742 children during fifteen years at the epilepsy clinic of the Johns Hopkins Hospital, founded in 1927 by Edwards Park and Adolph Meyer. A search for causative factors has been uppermost throughout; and in consequence epilepsy is considered less a disease entity than a symptom complex due to a variety of diseases and precipitating agencies. At the outset the extent of the problem is stressed, the author stating: "The incidence of epilepsy is equal to that of active tuberculosis or diabetes, and amounts to one out of every 300 to 400 in the population."

The book is divided into three parts, the first dealing with causation. The views on heredity are balanced and sensible, statistical evidence showing that only in a small proportion of families is this factor of significance. Conditions such as fainting, migraine and mental disease are left out of consideration, as their relationship to epilepsy is still unproved. It is concluded that the central problem is not to study heredity by itself, but the pathological physiology of the disorder, part of which may be the result of inherited tendencies. It is estimated that "the chance of an epileptic having epileptic children is approximately one in 40; with the non-epileptic parent the risk is less".

Ætiologically, head injury of some sort is the most frequent causative agent. Among 742 cases there was no evidence of brain damage in 30%, definite evidence in 50%, and possible damage in 20%, birth injury being much the most frequent trauma. As illustrating the complexity of causation, it is pointed out that at least half those with such cerebral lesions never develop epilepsy. Interesting observations are made (page 239) on possible damage caused by the seizures themselves, an aspect which should be pondered by psychiatrists using electro-convulsive therapy.

Part II of the book is concerned with clinical manifestations and treatment. The latter requires a careful evaluation of all the various factors influencing any particular case. Drug therapy is fully dealt with. It is pointed out that phenytoin ("Dilantin") and phenobarbital are not interchangeable, the former not being a true sedative. Caution is required on changing from one to the other, and the author does not use them in combination. Concerning *petit mal*, it is claimed that the common drugs, including

¹ "Essentials of Obstetrical and Gynecological Pathology", by Robert L. Faulkner, M.D., F.A.C.S., and Marion Douglass, M.D.; Second Edition; 1949. St. Louis: The C. V. Mosby Company Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9" x 7", pp. 362, with 300 illustrations. Price: 89s. 6d.

¹ "Epilepsy and Convulsive Disorders in Children", by Edward M. Bridge, M.D.; 1949. New York, Toronto and London: McGraw-Hill Book Company, Incorporated. 9" x 6", pp. 690, with illustrations. Price: \$8.50.

phenytoin, are of little or no value, and may aggravate the condition. This seems rather too sweeping a statement. "Tridione" is considered useful. Ketogenic diets are given in detail in spite of the difficulties in maintaining their use. The chapter on psychotherapy is most interesting, and deals with both play therapy and analysis.

In Part III diagnostic procedures—electro-encephalography, artificial induction of seizures, and pneumo-encephalography—are considered.

In the light of this most valuable and comprehensive work, the author's claim that "no physician, however well trained, possesses all the skills necessary for the physical, emotional and social needs of large numbers of epileptic children" is no over-statement. Coordination becomes essential, and epilepsy being so widespread, most doctors at some time are concerned in its treatment. For this reason it is hoped that this book will be widely read.

DISEASES OF CHILDREN.

THE second volume of the fourth edition of Garrod, Batten and Thursfield's "Diseases of Children" is available.¹ It is edited by Donald Paterson and Alan Moncrieff, and maintains the same general high standard set in the first volume. There is much new material in the book, and with Volume I, it provides a text-book that covers most of the needs of the general practitioner interested in paediatrics. If he needs more information he will find it in the excellent list of references at the end of each section.

This volume continues the systematic discussion of diseases of children commenced in the first volume. A surgeon collaborates with a physician in the section on organic disease of the nervous system and so an adequate cover of such subjects as head injuries, cerebral tumour and abscess is provided. Discussions of encephalography and ventriculography are included. The section on functional nervous disease includes new material in the discussions of mental testing and electro-encephalography. Most of the section is splendid, but parts would be better for shorter sentences, fewer words and less psychiatric jargon. Congenital mental defect is the subject of a short but useful chapter. The description of the epilepsies is rather jumbled and the treatment out of date. Soluble phenytoin ("Dilantin Sodium") is not given the credit it deserves. "Tridione" and mesantoin are not mentioned, though Lennox was describing their use in America in 1945 and 1946 respectively.

Short chapters on diseases of the eyes and orthopaedic surgery give a good general cover of the principles of treatment without detail. A warning about renal rickets is necessary, but it is surprising that the editors allowed such a sweeping statement as the one on page 409 which implies that the combination of albuminuria and knock-knees means renal rickets with its "remote chance of the child growing up". Albuminuria suggests, but does not "indicate", renal inadequacy, and simply calls for investigation in a child with knock-knees or without. A splendid section on diseases of bone is liberally illustrated and leaves little to be desired. Medical and surgical aspects of genito-urinary disease are soundly dealt with in separate chapters. It is interesting to see the authors firmly supporting the identity of lipoid nephrosis and denouncing circumcision during infancy. It is interesting, too, to see sulphanilamide recommended as the sulphonamide of choice in pyuria. The difficult subject of hepatitis and cirrhosis might have received fuller attention.

The chapters on rheumatism and cardio-vascular disease are outstandingly good, and include a good deal of detail on the diagnosis of congenital defects. We should like to see some discussion of the larger doses of salicylates in acute rheumatism recommended by many workers nowadays. The section on blood disorders is concise and excellent, but exchange transfusion in erythroblastosis, though new, might have found a place. "Infectious Diseases", by H. Stanley Banks, a fever hospital superintendent, is perhaps the best chapter of a book where much is excellent and most is good. We know of no better discussion of the common infectious diseases in a general medical text-book. Useful, well-illustrated chapters on diseases of the skin and malignant disease complete the book.

We have no hesitation in recommending this as a sound and interesting text-book of paediatrics.

¹"Diseases of Children", edited by Donald Paterson, M.D. (Edinburgh), F.R.C.P., and Alan Moncrieff, M.D. (London), F.R.C.P.; Fourth Edition; Volume II; 1949. London: Edward Arnold and Company. 9" x 5½", pp. 1048, with 380 illustrations. Price: 40s.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Medical Clinics of North America" (issued every two months); 1949. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Proprietary, Limited. Massachusetts General Hospital Number. 9" x 5½", pp. 308, with 25 illustrations. Price: £7 5s. per annum (cloth binding) and £6 per annum (paper binding).

Comprises a symposium on recent advances in medicine (16 articles) by members of the Massachusetts General Hospital staff and five additional articles from various sources.

"The Medical Clinics of North America" (issued every two months); 1949. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Proprietary, Limited. Philadelphia Number. 9" x 6", pp. 412, with 26 illustrations. Price: £7 5s. (cloth binding) and £6 (paper binding) per year.

Consists of three groups of contributions. The first is a symposium of nine articles on acute medical emergencies from the Benjamin Franklin Clinic of the Pennsylvania Hospital. The second is a symposium of eight articles on nutritional disorders from the Pennsylvania General Hospital. The third comprises two articles on other subjects.

"Buchanan's Manual of Anatomy", edited by F. Wood Jones, D.Sc. (London), F.R.S., F.R.C.S. (England), F.R.A.C.S., assisted by E. L. Patterson, M.D., B.Sc. (Manchester), S. Mottershead, M.D., B.Sc. (Manchester), F.R.C.S. (England), T. E. Barlow, M.D. (Manchester), M.R.C.S., L.R.C.P., E. R. Wilde, M.B., Ch.B., B.Sc. (Manchester), F.R.C.S. (England), and Jessie Dobson, M.Sc., B.A. (Manchester); Eighth Edition; 1949. London: Baillière, Tindall and Cox. 8" x 6", pp. 1630, with 847 illustrations. Price: 45s.

Some revisions and corrections have been made in the seventh edition, but the format of the work has not been changed.

"Introduction to Public Health Law", by John J. Clarke, M.A., F.S.S.; 1949. London: Cleaver-Hume Press, Limited. 8½" x 5½", pp. 142. Price: 12s. 6d.

Planned as a guide to the provisions of the principal British Acts dealing with public health, food, drugs and so on.

"Aids to Obstetrics", by Leslie Williams, M.D., M.S. (London), F.R.C.S. (England), F.R.C.O.G.; Twelfth Edition; 1949. London: Baillière, Tindall and Cox. 6" x 4", pp. 270. Price: 5s. 6d.

One of the "Aids" series intended for medical students. The book deals successively with pregnancy, labour and obstetric operations.

"Handbook of Medical Protozoology: For Medical Men, Parasitologists and Zoologists", by Cecil A. Hoare, D.Sc. (London); 1949. London: Baillière, Tindall and Cox. 9" x 6½", pp. 356, with 43 illustrations. Price: 35s.

Written to meet a demand for a short text-book devoted to medical protozoology and based on lectures delivered to post-graduate students.

"Nomenclature of Fungi Pathogenic to Man and Animals: Names Recommended for Use in Great Britain"; Privy Council; Medical Research Council Memorandum, No. 23, by The Medical Mycology Committee of the Medical Research Council; 1949. London: His Majesty's Stationery Office. 9½" x 6", pp. 16. Price: 6d.

The 65 species of fungi listed as pathogenic to man in the British Isles have been recorded there under 150 names. The memorandum comprises a list of carefully scrutinized names of the commoner fungi.

"Surgery for Nurses", by James Moroney, M.B., Ch.B., F.R.C.S. (England), L.R.C.P. (London), with a foreword by Miss Dorothy M. Smith, O.B.E.; 1950. Edinburgh: E. and S. Livingstone, Limited. 8½" x 5½", pp. 650, with 563 illustrations. Price: 27s. 6d.

Written for the student nurse preparing for her final examination.

The Medical Journal of Australia

SATURDAY, APRIL 8, 1950.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

EARS.

IMMOBILITY distinguishes the warden of hearing. It stands perpetually at attention, and is alert to every challenge. Its function is purely receptive and it may thus become a mute witness to treachery, a blind ambassador of pleasure, or a gauche guide to common gossip. But outwardly it gives no sign; it makes no imputation. It admits knowledge with the same impartiality as its receives bawdiness. It censors nothing. For the portals of hearing never close, and though one may turn a deaf ear to wisdom, this cockle of audibility will ever catch the echo of folly. Even as the open ears of youth go out to greet the busy world, evil inserts a finger in the latch of hearing. The ears of infancy are quick to catch more than was intended. Though the politician may put his ear to the ground, the cunning man listens and hears more than meets the ear. The clown laughs, giving ear to a naughty tongue, while the wise man trieth words in his ear as the mouth trieth meat, and rejects all that is unwholesome. But how few are wise when the sounds are beguiling and the words delectable? To have "uncircumcised ears" is to be deaf to the word of God; but who can resist the call of love when "the voice of the turtle is heard in the land"?

"Had I three ears, I'd hear thee", exclaimed the distraught Macbeth to the apparition of the bloody child. Three-eared monstrosities have been reported in medical literature; but there is no case known of three or more completely functioning ears. Mythological monsters displayed many hideous anomalies, but none were credited with more than two ears, unless, like Cerberus, they possessed more than one head. Supernumerary auricles are not unknown; but the only third ear a man may possess is that of intuition. This hypothetical member reports merely the "hunches" which come occasionally to the sentient and defy interpretation. Absence of one or both external ears has been recorded in persons whose hearing was unimpaired. A blow upon the ear may rupture the tympanum and violent sneezing may have a like effect; but deafness following a kiss on the ear, as

has been said to have occurred, must have been the result of a trauma more psychic than physical. But in the domain of whimsy nothing is impossible; and medical writers in the past, seeming more credulous than scientific, have reported menstruation from the ears.

The meatus mystifies. And as any orifice invites exploration, children who persistently put things into their mouths not infrequently insert objects into their ears, to the consternation of parents and the anxiety of doctors. Literature is rich with examples of small objects, from cherry-stones to pencils, which have been inadvertently poked into the auditory canal—sometimes with disastrous consequences. Indeed, the cabin of the ear has had more things than secrets thrust into it. Beads and berries innumerable have found their rest there; but the report of a diamond removed under chloroform from the ear of a child indicates an occurrence rarer than the gem itself. Though crime knows no foil, poison has rarely found its way into the ear. The "leperous distilment" which Hamlet's uncle used could not have reached the king's veins through "the portals of his ears". This did not deter the dramatist and the king obligingly died in the manner intended; but when, with less subtlety and more devilry, a Negress poured molten pewter into her sleeping husband's ear, deafness, according to medical report, was the only permanent result. Crickets and other insects have been known to find a lodging in the auditory canal, driving their hosts to the edge of distraction with discomfort and pain during their tenancy; and popular superstition credits the centipede with a special proclivity for entering the ear and causing death when it has reached the brain.

The physician, like the priest, hears many strange confessions; but sounds meaningless to the latter may be of signal value to the former. From the first faint whimper of life to the dying death-rattle of age, the physician's ear is alert to the significance of human sounds, not only to the articulate signs of urgent dispatch or the agonized cry of a troubled conscience, but to those sounds connected with bodily function which do not rise into speech. These may be the messengers of health or the harbingers of disease. They may be heard by percussion or conveyed by auscultation. A strange music engages the attention of the doctor when he applies his modified ear-trumpet to the chest. When, perhaps, the tidal murmur of the breath is hastened and roughened by the congested lung, and the padded footfall of the heart loses its measured tread along the echoing corridors of time, the listening ears of the physician spell a warning that may not be denied. Or the orchestra of the chest may be hushed and muted crepitations fill the ear with bodeful melody, or the pert squeak of a rhonchus may introduce a theme of more hopeful import. The heart has a music of its own, beating out a measure of love or falling into a sad *adagio* of grief. Its strings are sensitive to the touch of emotion; and the *rondo* of its contentment is the mark of health. Many sounds tell their own story. The egg-shell crackling of subcutaneous emphysema, the succussion splash of hydrothorax, the slow stertor of the comatose and the high stridor of the diphtheritic are all familiar sounds to the physician. The crude belch or the indecent passage of wind may give rise to mirth just as the inelegant borborygmi of the staid spinster may cause embarrassment in mixed company, but the "brassy"

cough due to an aortic aneurysm and the crepitus of a broken bone tell a different tale. The body registers its distress in many ways, and not the least of these is by a secret whisper into the questing ear of the physician who has learned to interpret all the rumbles, squeaks, grunts and snorts peculiar to the organ concerned. The ear becomes a diagnostic aid, without which many of the cryptic signs of illness would pass unnoticed.

The ear is often an object of assault and sometimes of battery. Blasts and screams produced in this present mechanical age often tower over the old hubbub of earth and assault the ear unmercifully. Though noise may be ear-splitting, words may be as devastating. Nagging wives know this and administer recurrent ear-bashings to their recalcitrant husbands. And many a man, be he husband or lover, has at some time or other had his ear bitten by a shrewish woman, or had his most cherished dreams pulled about his ears. The biting of the ear is a metaphorical rebuke and must not be confused with the love-bite executed in a moment's passion on the lobe of the loved-one's ear. The ear-bashing commonly perpetrated by nagging wives and tiresome busy-bodies refers to a verbal onslaught upon the tympanum; but the external ear may occasionally be the seat of a literal bashing. The irate parent may "box" the child's ear, or in pugilistic combat the ear may be heavily punched and the resultant hematoma produce the well-known "cauliflower" configuration. The ear may be decorated—it may also be disfigured. In olden times men lost their ears for a mere peccadillo. Sent to the pillory to become a cockshy for the crowd, the offender frequently had his ear lopped off for good measure. When religious controversy raged in seventeenth century England dissenting pamphleteers were frequently committed to the pillory and ordered to have their ears removed. History records that Alexander Leighton, who had studied physic at Leyden but who was prevented from practising in England by the College of Physicians, met this fate, though mercy tempered the king's judgement and only one of his ears was cropped. The celebrated William Prynne, author of "Histriomastix", together with Henry Burton and John Bastwick, a practising physician in Colchester, was in 1637 sentenced to the pillory and the loss of his ears. On this occasion it is recorded that the executioner "heated his iron twice to burn one cheek and cut off his ears so close that he cut off a piece of his cheek". Daniel Defoe was pilloried, but it is questionable whether he lost his ears. The well-known line "Earless, on high stood unabash'd Defoe" may be merely an example of plausible poetic licence on the part of Pope. Mutilation as a punishment has passed away. The ear of the modern miscreant is respected; and though it may burn in shame at his sentence, he will forfeit his liberty rather than his auricle.

In certain primitive tribes the ear is regarded as the seat of the intelligence, so that when an enemy has died bravely his ears and other parts of his body are cut off and after suitable treatment are given to youths in order to impart like qualities. At the festival of the Mexican maize goddess, the celebrants do penance by drawing blood from their ears. At the annual meeting at the grove of Salih, the sacrificial victims are led to the mortuary to have their ears cut off, so that the doorposts may be smeared with blood. The principles of sympathetic magic allowed certain native races to cut off the ears and

gouge out the eyes of their foes, hoping thereby to make their ghosts both deaf and blind. Archaic memories stirred up in the minds of psychotics sometimes have reference to the ears in ceremonial association. Foreign bodies inserted in the auditory meatus and mutilation of the auricle itself may occur in reference to hallucinatory commands. Such hidden voices may have impelled the painter Vincent van Gogh to cut off his ear with a razor and post it to his lover.

The human ear, in its long evolutionary history, may have had other uses than acoustic, but none more strange than the fancied pathway to pregnancy. Certain early Christian Fathers believed that the Virgin Mary became divinely impregnated when the Holy Ghost breathed into her ear. Many of the religious paintings in the Middle Ages portray this operation; these paintings usually display the Holy Dove entering the Virgin's ear. The auricle as the receptive organ is not entirely confined to Christian teaching. It may be found in other and earlier myths. The Mongolian virgin, Maya, was impregnated through her right ear while she slept, and the first man in the Persian cosmogony was created when the Divine Being placed his hand into the ear of the female.

The seat of a whisper, the lodging of a laugh, the passage of instruction—the ear in its time serves many auditory devices. Much that is delightful and much that is dreary in life come into consciousness through its labyrinthine channels. Words of wisdom and the accents of folly jostle in the portals of hearing with the tender plaint of love and the coarse oaths of the inebriated. The ear is the market-place of sound. All the clamour of living echoes through its booths. It may discriminate sounds but it cannot banish noise. This, surely, is the primal curse. The eye closes but the ear remains patent—a prey, in this industrial era, to every screech and clatter that every mechanism generates. No merciful canopy drops gently over the auditory meatus to shut out the drone of traffic or the tattle of an empty head. No plug of wax, no artificial earpad can give the benison of complete silence. Yet there is a silence more eloquent than speech and more musical than song. Few know of its enchantment in these fretful days.

Current Comment.

SYMPTOMLESS ALBUMINURIA.

THE significance of albuminuria found during routine examinations in the absence of any other suggestion of renal disease has been the subject of many investigations. A recent study, carried out by H. B. Salt and W. H. McMenemey,¹ has some features of interest. It contains the results of laboratory investigations, made in the period 1942 to 1948, into 193 young adults who, at their routine medical examination for recruitment into the services, had all been found to have symptomless albuminuria. Each subject provided three samples of urine for examination: the first on his arrival at the laboratory, the second after sitting for one hour, and the third after lying down for one hour. The first specimen was examined for the presence of red or white blood corpuscles or casts in the micro-deposit, and all samples were tested for the presence of protein; quantitative determinations of protein content were carried out in selected cases. Blood urea determina-

¹ The American Journal of the Medical Sciences, October, 1949.

tions and urea clearance tests were carried out in all cases. In 53 cases (27%) no albumin was found in the urine at the laboratory; all the subjects concerned had normal urea clearance values and one only had an increased blood urea value which was not considered significant (microscopic examination of the urine in this case revealed no abnormality). "Postural albuminuria" was diagnosed in 65 cases (34%), the characteristic features being an insignificant micro-deposit and initial albuminuria which was abolished by adoption of the recumbent posture. Two of this group had abnormal blood urea contents and significantly reduced urea clearance values; one of these had red blood cells and casts in the urine and was diagnosed as having nephritis, but the other patient, whose urine contained no microscopic abnormality, had undergone previous nephrectomy and to that the findings were attributed. A group of 41 individuals (21%) had "persistent albuminuria"; in no case was the micro-deposit of significance, and all blood urea and urea clearance values were normal. In the fourth group of 19 individuals (10%) the albuminuria was regarded as being "due to nephritis"; all members of this group had red blood cells or casts or both in their urinary deposit, two had abnormal blood urea and urea clearance values, and one had an abnormal blood urea value only. Of the last group of 15 individuals (8%), whose albuminuria was classed as "due to infection", 12 had persisting albuminuria and three had protein-free urine after lying down; microscopic examination revealed red blood cells in the urine of nine and a significant number of pus cells in the urine of all, and though organisms were found in only seven cases, all samples were considered to show evidence of infection.

It is important to note that the albuminuria described as due to nephritis (19 cases in all) was constant in only nine cases, somewhat diminished by recumbency in seven cases and completely abolished by recumbency in three cases. Thus, as Salt and McMenemey point out, while persistent albuminuria together with an abnormal urinary deposit provides immediate evidence of renal disease, albuminuria significant of organic disease may show considerable variation with changes in posture. The degree of albuminuria was found in this series to have no diagnostic significance. For a patient with any degree of albuminuria in the recumbent position or a micro-deposit arousing any suspicion, a urea clearance test may provide further evidence of disease and its performance is therefore advisable; the result, with the albuminuria and microscopic evidence, will reveal the occasional case of renal disease which may otherwise go undiscovered. On the other hand, when proteinuria of postural type is definitely demonstrated and the urinary deposit is above suspicion, renal function tests are not necessary, for they will not contribute any indication of kidney disease. These conclusions, which Salt and McMenemey seem quite justified in drawing from their observations, provide a useful practical basis for the investigation and medical grading of individuals with symptomless albuminuria.

A SYMPOSIUM ON DIABETES MELLITUS.

THOSE who are interested in an up-to-date and relatively brief survey of the broad aspects of *diabetes mellitus* will find it in a symposium recently assembled by Russell M. Wilder.¹ It is designed for a general medical audience rather than for the specialist, but it offers nevertheless important current views. The subjects covered are in "fields which at present are undergoing energetic cultivation", and much of the material, Wilder points out, is not as yet in text-books. Notable investigators are included among the contributors, and it is interesting to note two reasons suggested by Wilder in his foreword to account for the attraction of outstanding people to the study of diabetes. The first is that this disease is a health hazard of major significance; Wilder quotes figures

compiled over many years at the Mayo Clinic which imply that in the population from which the patients of the clinic are drawn (figures which should reflect the general state of affairs), the incidence of diabetes between 1920 and 1941 was multiplied by three or more, and though since 1941 there has been no further increase, the incidence is still great enough to warrant major efforts in the detection and treatment of the disease. A second reason suggested is the fact that *diabetes mellitus* affords unusual opportunities for study of the machinery of metabolism. It is appropriate therefore that the first paper in the series, contributed by DeWitt Stetten, deals with carbohydrate metabolism. This subject is covered fairly completely in broad terms with the emphasis on modern concepts. The point is brought out in the discussion that the catabolic pathways of the carbohydrates, fats and proteins cross at many points and that within wide limits one nutrient may be substituted for another without significant injury to the metabolizing tissue. The classic lines of demarcation between the metabolisms of each of the three have become, Stetten states, progressively more obscure and more meaningless. The picture that is developing is one of reaction sequences, often cyclic, which liberate energy as needed by the organism, and these cycles apparently may be fed at many points and in many ways. Although extreme deviation from the normal composition of the nutrient mixture may result in the undue accumulation of one or another intermediate, a considerable degree of variation is tolerated.

The complexity of factors associated with the role of the pancreas in *diabetes mellitus* and the importance in certain cases of other endocrine glands are brought out in papers by R. E. Haist on experimental diabetes and by W. M. Balfour and R. G. Sprague on diabetes and disorders of the anterior pituitary lobe, the thyroid and the adrenal cortex. Balfour and Sprague present reports of ten cases in which *diabetes mellitus* was associated with hyperfunction and hypofunction of these glands; in general, they state, lesions causing hypofunction ameliorate existing diabetes and those causing hyperfunction intensify it, and in rare cases hyperfunction of the anterior part of the pituitary due to eosinophilic adenoma, or of the adrenal cortex due to tumour or hyperplasia, may apparently be the sole cause of diabetes.

The remaining four papers are of considerable practical importance. Priscilla White discusses pregnancy complicating diabetes in the light of experience with 439 cases of this condition in which the foetus was viable. This experience has suggested that in order to prevent the high foetal wastage associated with diabetes of pregnancy, management should include good treatment of the diabetes, substitutional hormonal therapy, the correction of oedema and hydramnios, premature delivery, and special care of the infant; these are dealt with in some detail in the paper. Joseph H. Barach deals with arteriosclerosis and diabetes, the importance of which is emphasized by his statement that "we now seem justified in speaking of the universality of arteriosclerosis in diabetes". It is clear from Barach's general discussion on the aetiology of arteriosclerosis that no definite rationale for a scheme of treatment is justified. However, as he points out, we must care for our patients in the light of present-day knowledge, restricted as it is, and his aims are to restore and maintain a normal or ideal body weight, to allow adequate daily protein intake, to give the smallest amount of fat that will make up a satisfactory diet and to reduce the cholesterol intake. Possible forms of specific medication are still in the experimental stage, but it is to be hoped that something of clinical value will soon emerge. It is not possible to do more than draw attention to the last two papers. In one Russell M. Wilder, junior, describes a simplified method for managing the majority of diabetics encountered in a general medical practice, and in the other George M. Guest considers diabetic coma and its management. These will be considered the most important papers of the symposium by some practitioners; others will prefer the earlier papers. However, all who are concerned to keep in touch with developments in these major aspects of *diabetes mellitus* should find the whole symposium of value.

¹ *The American Journal of Medicine*, November, 1949.

Abstracts from Medical Literature.

THERAPEUTICS.

Antihistamine Drugs in Severe Asthma.

H. J. RUBITSKY *et alii* (*The New England Journal of Medicine*, December 1, 1949) have treated fifteen acutely ill asthmatic patients, eight of them in the "intractable" state, that is to say, no longer deriving relief from injections of adrenaline, with anti-histamine drugs ("Benadryl" and "Pyribenzamine") administered by aerosol, by enema and intravenously. Significant relief from bronchospasm and prompt restoration of sensitivity to adrenaline followed the intravenous medication in ten of the fifteen patients. The least favourable results occurred amongst patients who had plugs of inspissated mucus in the bronchi and in old people with significant and irreversible cardiac and pulmonary disease. The authors advise that the antihistamine drugs should be administered parenterally only as adjuncts to other effective forms of treatment in the management of patients asthmatically ill with bronchial asthma.

Penicillin in Respiratory Diseases.

S. J. WEINBERG AND G. L. PACKER (*Archives of Internal Medicine*, September, 1949) describe aerosol and micronized ephedrine and penicillin therapy of diseases of the lower part of the respiratory tract. Inhalations of mechanically nebulized 3% solution of ephedrine sulphate are effective in chronic bronchial asthma. In this study ephedrine, either in dust form or nebulized, was inhaled just prior to the inhalation of penicillin, which was given twice daily for a week and once daily for another two weeks. Inhalation of 30 milligrammes of ephedrine sulphate over five minutes was followed by inhalation of 100,000 units of crystalline penicillin calcium over a period of ten minutes. Ephedrine and penicillin dust ground to 1.5μ to 4.0μ in size was inhaled through a simple oral apparatus, or a nebulizer attached to an air compressor unit was used for moist inhalations, the air flow being at seven litres per minute. Thirty-nine patients were treated suffering from bronchiectasis, emphysema and asthma. Considerable benefit was derived from this treatment, both clinically and in the reduction of bacterial flora.

Essential Hypertension.

E. MAURICE HELLER (*The Canadian Medical Association Journal*, September, 1949) states that hypertension is divided into the two great groups: systolic and diastolic. Systolic hypertension, in which only the systolic pressure is raised, may be found in the elderly, being due to an atheromatous aorta, and also with aortic regurgitation, thyrotoxicosis, complete heart block, patent ductus arteriosus and arterio-venous aneurysm. Diastolic hypertension, in which the diastolic pressure is 100 millimetres of mercury or more, is divided into three groups: (i) secondary to a known underlying process or disease which cannot as a rule be completely remedied, such as glomerulo-nephritis, polycystic disease

of the kidneys, and Cushing's syndrome; (ii) due to more specific and often remediable causes, such as enlarged prostate, kinking of a renal vessel, pheochromocytoma, coarctation of the aorta and unilateral pyelonephritis; (iii) primary or essential hypertension, in which adequate tests have been performed to rule out known aetiological factors. The author discusses the treatment of essential hypertension under four headings: (i) rest, sedation and psychotherapy, (ii) reduction of weight, (iii) sodium restriction therapy, and (iv) sympathectomy. Diagnosis is of primary importance. The non-essential types of hypertension are first excluded. Then the condition must be classified as systolic or diastolic, or both. Systolic hypertension is less important, and occasionally the specific cause can be treated. Diastolic hypertension, if secondary to a known underlying disease, should be treated or eliminated. Treatment of unilateral pyelonephritis is disappointing, and only the most thorough and complete clinical studies and refined kidney function tests can justify nephrectomy in view of the probability of hypertensive damage to the contralateral kidney. Every case of diastolic hypertension should be thoroughly investigated, with a radiographic film of the heart shadow, examination of the retina, cardiographic examination, and renal function tests. The response of the blood pressure to lability tests should be recorded. If the hypertension is essential in type, adequate medical therapy should be given a fair trial, including increased rest, sedation and psychotherapy, cessation of smoking and, if obesity is present, a reducing diet. All patients are advised to cut down their sodium intake. The author considers that benefit from Kempner's rice diet is primarily due to the low sodium intake. He discusses the criteria for sympathectomy.

Rheumatoid Arthritis.

D. G. MARKSON (*The Journal of the American Medical Association*, October 15, 1949) describes prolonged treatment of rheumatoid arthritis with pituitary adrenocorticotrophic hormone (A.C.T.H.). Two patients were treated, 25 milligrammes of pituitary adrenocorticotrophic hormone being given every six hours for two weeks, and then 50 milligrammes daily in three doses for three weeks. After this the dose was reduced to 15 milligrammes at twelve-hour intervals and continued for four months. Both the patients treated had acute polyarthritis with much swelling and disablement. In both cases remarkable improvement was noted within a few days. Pain was relieved, movement of joints improved, appetite increased, and the blood count and sedimentation rates became normal. In both cases the patients were able to get about freely, and one of them returned to work. The benefit has been maintained so long as the treatment has been continued.

DEAN ROBINSON (*The Canadian Medical Association Journal*, August, 1949) discusses the treatment of rheumatoid arthritis. He advises rest in bed in the acute stages, analgesics and sedatives as required, heat, preferably in the warm pool, where active movement can be carried out, and an ordinary mixed diet. Gold injections are started as soon as the diagnosis is made, and 22 injections are given if no contraindications appear. In 1% of

cases severe reactions follow gold therapy; BAL should be given at the first sign of intolerance, 2.5 to 3.0 milligrammes per kilogram of body weight being given intramuscularly every four hours for forty-eight hours and in decreasing doses for ten days. Active and passive movements, manipulation under anaesthesia and the use of temporary plaster casts are advised. Persistent endeavour and the consideration of all aspects of the disease are necessary.

Trigeminal Neuralgia Cured by Electroshock Therapy.

EDWARD R. JANJIGIAN (*The American Journal of Psychiatry*, August, 1949) reports three cases of trigeminal neuralgia treated with electroshock therapy; in each case complete relief of symptoms occurred. Each patient had obtained symptomatic relief after alcoholic injection of the nerve, but recurrence followed in two to four months. The first patient developed suicidal ideas, and this apparently suggested electroshock therapy. The second patient had an obsessional personality with a superimposed tension state combined with depression. The third patient was subject to severe attacks of pain requiring one grain of morphine for relief. Two patients received one treatment and the other two treatments. It is suggested that further studies will be required before conclusions can be drawn.

Oral Penicillin Therapy.

W. W. G. MACLACHLAN *et alii* (*The Canadian Medical Association Journal*, August, 1949) discuss oral and intramuscular penicillin therapy. They state that penicillin is in a class by itself in the treatment of pneumococcal pneumonia, but that penicillin wax injections have caused some very disagreeable reactions, and they recommend an injection of 300,000 units every twelve hours for two doses and then every twenty-four hours. This was effective in pneumococcal bacteraemia. In a series of cases the authors used oral penicillin therapy, one tablet of 100,000 units of calcium penicillin every hour for six doses and then every two hours for 18 doses—in all 24 tablets and 2,400,000 units. No alkalis were given. Delirium or vomiting necessitated intramuscular treatment. The authors treated a series of patients suffering from pneumococcal pneumonia, many of whom had bacteraemia. In this series the patients were mostly seriously ill at the onset, but a leucocyte count of 10,000 per cubic millimetre or less was not unusual. In spite of this the mortality rate was low (7%). In 1935-1936, among patients with a low white cell count a mortality of 61% prevailed, and 46% had pneumococcal bacteraemia. Penicillin makes light of these complications in the authors' view. They state that the temperature in pneumococcal pneumonia falls suddenly by crisis within one or two days, or slowly by lysis. In other cases there is a recrudescence of fever after one to two days, and this lasts for two to four days. A clear pleural effusion was common in this series during treatment. Empyema, endocarditis and meningitis were rare, but the authors consider that a continuing temperature is suggestive and may necessitate paracentesis thoracis or other exploration. Penicillin blood levels one hour after administration of

100,000 units by mouth were 1-60 units per millilitre with 1-09 units per millilitre after two hours. The blood level of penicillin was not very important. Patients whose blood on culture yielded many colonies of pneumococci for each millilitre of blood recovered, whether the blood penicillin level was one or fifteen units per millilitre. With a high blood penicillin level there was usually nitrogen retention. This did not indicate a serious prognosis, however, and was not indicative of acute nephritis. The results of oral penicillin therapy were equal to those obtained by intramuscular injection. The authors recommend its use.

"Tridione."

N. VAN WEZEL (*The Journal of the American Medical Association*, September 24, 1949) reports a case of purpura and neutropenia occurring during "Tridione" therapy, with recovery. He states that the drug has been used in epilepsy, having been synthesized in 1944 by Spielman. It is 3,5,5-trimethyloxazolidine-2,4-dione. Three cases of neutropenia with exfoliative dermatitis and purpura have been recorded. In the case reported a woman, aged fifty-four years, who suffered from "the shakes", was treated with five grains of "Tridione" thrice daily. After twelve days she experienced nausea and vomiting. On the fourteenth day giant urticaria was observed, followed by a macular and purpuric rash and exfoliation. Blood transfusions, intravenous administration of fluids, penicillin, menadione and ascorbic acid were used in treatment. There was high fever for some days. The patient eventually recovered.

NEUROLOGY AND PSYCHIATRY.

Relief of Symptoms after Encephalography.

K. J. KORNREICH (*Archives of Neurology and Psychiatry*, November, 1948) suggests for relief of the severe symptoms of headache which may follow encephalography, a combination of barbiturates beforehand and 95% oxygen, administered at the rate of eight metres per minute by means of an ordinary oxygen tent, immediately afterwards. Within three hours the patient is usually comfortable. This satisfactory outcome may be due to the oxygen's helping in the restoration of the cerebro-spinal fluid volume.

Insulin and Electric Shock Treatment.

S. PASTER and S. C. HOLTZMAN (*The American Journal of Psychiatry*, May, 1949) have studied psychoses in war veterans. Approximately one-third of the patients whose illness was precipitated in combat had recovered by the time of their arrival in America, and about one-fifth continued to improve under the socializing influence of hospital. Patients who, after a period of observation, showed no trends towards spontaneous improvement, were treated with shock therapy. The study covers 1000 patients treated during a period of thirty months; 570 patients were treated with electric shock treatment, 241 with insulin and 189 with electric shock treatment followed by insulin. Electric shock treat-

ment was used in manic-depressive psychoses, for stuporose catatonics, for disturbed psychotics and for paranoid schizophrenics who displayed good affectivity. Insulin was given to paranoid schizophrenics who appeared dull and apathetic, to catatonic patients presenting no difficulty in management, to manic-depressives manifesting paranoid trends and to maladjusted psychotics. Of the 1000 requiring specific treatment, 78% achieved a full or partial remission. Insulin is considered more effective than electric shock treatment in the treatment of paranoid and catatonic schizophrenia and the remissions are more lasting. Psychotic reactions precipitated under stress of combat respond somewhat better than those occurring in non-combat personnel; the well-integrated prepsychotic personality proved to be of favourable prognostic significance.

Studies of Prisoners Charged with Murder.

D. STAFFORD-CLARK and F. H. TAYLOR (*Journal of Neurology, Neurosurgery and Psychiatry*, November, 1949) found in a study of a group of prisoners charged with murder that in over 70% of cases in which the crimes appeared motiveless the electroencephalographic record was very abnormal.

Thrombosis of Intracranial Veins.

DAVID KENDALL (*Brain*, December, 1948) discusses thrombosis of the intracranial veins. The cases formed two groups. In the first group the condition followed childbirth, the clinical features being headache, which was constant and early, generalized or unilateral, followed by convulsive phenomena, local or generalized, and often associated with signs of a localized cerebral lesion; sometimes increased intracranial pressure, papilloedema and red blood cells in the cerebro-spinal fluid were noted. The author discusses the question whether the condition is due to the retrograde embolus, which is unlikely, or to an intracranial thrombosis due to local damage of the vessel wall associated with the changes in the circulating blood. In the second group the thromboses were associated with local or general septic conditions. The author points out that this group is more common and the condition may precede or follow the development of a cerebral abscess. He suggests that the conditions can be differentiated from the cerebral abscess in that the symptoms are preceded by an acute infection, of short duration, particularly in the frontal sinus, the cerebral symptoms are of sudden onset and the general disturbance is great, whereas with an abscess the onset is gradual and there are few general symptoms.

Auditory Hallucinations.

L. N. GOULD (*The Journal of Nervous and Mental Disease*, May, 1949) has investigated the mechanism underlying auditory hallucinations. By the use of a high level electronic tube amplifier, microphone and ear-pieces, he has found that there is a pronounced correspondence between the subvocal speech heard by the operator and the voices heard by the subject. The latter was a woman, aged forty-six years, who was almost continuously hallucinated. The speech was of whispering type, variable in distinctness and altered in quality from her voluntary whisper. Both inspiratory and ex-

piratory phases of respiration were utilized for production. It varied with the physiological state of the subject. It was prominent when she was awake and absent during her sleep. Enhancement was produced by preceding audible speech, particularly of an emotional nature. Inhibition occurred with distraction. Its activity was also influenced by "Sodium Amytal" followed by caffeine sodium benzoate, both given intravenously. The phenomenon appeared to represent automatic activity of a psycho-motor process—of thought and its motor expression involving respiratory and vocal musculature. The author affirms that in cases in which the neuro-muscular process is not sufficient to produce subvocal speech there is increased muscle potential of the vocal organs.

Vertebral Fractures in Shock Therapy.

P. POLATIN and L. LINN (*The American Journal of Psychiatry*, May, 1949) review 24 cases in which vertebral fractures followed "Metrazol" and insulin treatment over ten years ago. Neurological and orthopaedic examinations were made to study possible late results of vertebral fractures produced by convulsive therapy. The standard treatment at the time of injury was the administration of aspirin and codein and rest for a few days for those patients complaining of symptoms. To those not complaining no treatment was given. Of the 24 patients, four complained of occasional non-disabling backache. In three cases, X-ray findings indicated an increase in the original abnormality involving the thoracic vertebrae. In no case was there any clinical evidence of orthopaedic or neurological sequelae to the original injury. Patients with vertebral fractures tolerated well subsequent convulsive therapy.

Muscle Spindles in Human Extrinsic Eye Muscles.

S. COOPER and P. N. DANIELS (*Brain*, March, 1949) investigated the muscle spindles in human extrinsic eye muscles. They found that the spindles were comparable in number to those found in the lumbrical muscles of the hand. The spindles present in the eye muscles usually had more delicate capsules and were smaller than those present in other skeletal muscles.

Retinal, Cerebral and Systemic Arteriosclerosis.

B. J. ALPERS, M. FORSTER and P. J. HERBUT (*Archives of Neurology and Psychiatry*, November, 1948) report a histological study of the retinal, systemic and cerebral vessels of 100 adults. In 14 cases the vessels were normal, in six cases there was sclerosis of the retinal vessels without cerebral involvement, in 35 cases both cerebral and retinal vessels were involved, and in 45 cases there was cerebral arteriosclerosis without retinal involvement. The cerebral lesions found were most common in the basilar artery. There was no correlation with the arteries in which the vascular lesions met with in clinical practice usually occur. The authors emphasize that the clinical and histological diagnosis of retinal arteriosclerosis does not necessarily correspond. Their work suggests that one cannot rely on the appearance of the retinal vessels in evaluating cerebral arteriosclerosis.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at Mooroopna and Shepparton, Victoria, on the afternoon and evening of November 12, 1949, the President, Dr. DOUGLAS THOMAS, in the chair. The afternoon meeting, which was held at the Mooroopna and District Base Hospital, took the form of a series of clinical demonstrations by members of the Goulburn Subdivision of the Branch. At the evening meeting, which was held at the "Grosvenor", Shepparton, in conjunction with members of the Law Institute of Victoria, Mr. R. N. Vroland read a paper entitled "The Legal Aspects of Artificial Insemination".

Hodgkin's Disease.

DR. R. O. MILLS presented a woman patient, a trained nurse, aged forty-one years, who complained of soreness down the right side of the neck on movement and several painless lumps at the back and right side of the neck for the past two months; a small lump below the occiput, which had been diagnosed as a sebaceous cyst eighteen months previously, was probably the first of the nodules. The patient complained also of a sensation like warm water trickling down the neck to the right shoulder, periodical swelling of the right foot with aching across the dorsum and loss of weight in the past year. She had two children, aged six and four years respectively. Eighteen months before the meeting she had undergone myomectomy and appendectomy; at operation stones had been felt in the gall-bladder. In the past year, after the death from malignant conditions of both her parents whom she had nursed, she had had much dyspepsia, palpitations and other nervous symptoms. Examination revealed that she was a middle-aged woman with rather heavy features, coarse skin, some hirsutism and adiposity as evidence of endocrine imbalance. Numerous firm subcutaneous nodules were present near the occiput, on both sides of the neck, in the supraclavicular region, at the angles of the mandible, in the axillae, especially on the left side, and in the groin. The spleen seemed to be just palpably enlarged. The blood contained 4,760,000 erythrocytes per cubic millimetre, with a haemoglobin value of 83% and a colour index of 0.9, and 6800 leucocytes per cubic millimetre, 56% being neutrophils, 40% lymphocytes and 4% mononuclear cells; the morphology of all cells was normal. X-ray examination revealed no abnormality in the lungs, heart, cervical vertebrae and abdomen. A biopsy of a gland had been made, but the result was not yet available.

Dr. Mills then discussed the differential diagnosis. He said that tuberculous adenitis could be excluded as there was not a pulmonary lesion or anything suggestive of tuberculous lesions elsewhere. In view of the endocrinal changes he had thought of the possibility of carcinoma of the adrenal cortex and he had realized that an excess of oestrogens had an influence on the growth of lymphomata. The patient was not likely to have leucæmia as the blood picture was different. It might be lymphosarcoma—the examination of the histological sections should decide that point. Boeck's sarcoid could be very variable in its manifestations, but that diagnosis was not as likely as Hodgkin's disease. Dr. Rupert Willis had graded all the lymphomatous conditions from benign to malignant as variations of the one disease. Dr. Mills went on to say that the usual prognosis was a duration of life of about two and a half years, but with irradiation an extension of life could be predicted; the five-year survival rate was stated as 10% and there was an 8% ten-year survival rate. The treatment by deep irradiation could not be regarded as curative, but rather as palliative. Radioactive isotopes of phosphorus had a selective influence on bone marrow, spleen and lymph glands, but that treatment was not available. There remained nitrogen mustard, on which more work had been done; that was showing promise. An article had appeared recently in the *British Medical Journal* from University College Hospital. There was a favourable response as a rule, but the treatment was not curative. The treatment was brief—only four days—but transfusions of blood might be required for granulocytopenia, and previous splenectomy might be helpful. Venous thrombosis and pain at the site of injection had been encountered, and as many as four veins had been used in four days. In the more localized groups radiotherapy still seemed the appropriate treatment, but it was not so effective for the generalized cases.

DR. J. E. SEWELL said that it was interesting to speculate on the diagnosis; he thought that the parotid glands were involved, and with pain in the right eye, the condition was

suggestive of sarcoidosis. He had had experience of the use of nitrogen mustard in the treatment of Hodgkin's disease in five cases at the Repatriation Hospital, Heidelberg; one of the patients had failed to respond to deep irradiation therapy, and the others also had done very badly. They had not had much trouble with the veins, though extensive thrombosis had occurred in one instance.

DR. T. D. HAGER thought that the patient might not be suffering from Hodgkin's disease, but rather from one of the variants of lymphoidosis. The patient was a nurse and the afebrile nature of the condition as stated was thus more dependable. He recalled the result of a biopsy investigation in a somewhat similar case, which was described as "reticulo-sarcoma", and that patient had done well with radiotherapy.

DR. GILCHRIST thought that the submaxillary glands were also involved; this reminded him of the Mikulicz syndrome.

DR. THOMAS said that he would place the case in a subgroup of sarcoidosis.

DR. C. H. FITTS mentioned that the dividing line between sarcoidosis and tuberculosis was not a fine one.

DR. J. B. MCMIKEN said that benign enlargements were commonplace, and that histological studies of them were deceptive, especially when opinions relating to the possibility or otherwise of Hodgkin's disease were based on them—mistakes were made both ways. He was by no means confident that they would find the solution in the report on the sections.

Dr. Thomas, in summing up from the chair, said that there was room for doubt, but he thought that Hodgkin's disease was tenable as the diagnosis as the spleen also was enlarged. The clinical responsibility for the diagnosis still remained even when the description of the examination of the gland was supplied by the pathologist.

A New Hæmorrhoidectomy Clamp.

DR. D. G. MACKELLAR showed a new clamp for use in sutureless hæmorrhoidectomy. He explained that with it, low spinal anaesthesia was employed. No pre-operative bowel preparation was used. No bleeding occurred at or after operation. No post-operative sedation was necessary other than morphine one-quarter of a grain (one dose) on the patient's leaving the theatre. No stenosis, no tags and practically no pain resulted. By means of slow screw crushing with the clamp a bloodless hæmorrhoidectomy had been achieved. Dr. Mackellar stated that in twelve cases the operation had been performed by the method; only in the first three cases was there any tightness necessitating some dilatation in the post-operative period. He claimed that only the pile was removed and the neuro-muscular mechanism was left intact by virtue of the fact that no skin or muscle was involved in the procedure.

DR. LEONARD BALL commented that the new method for treating piles was promising.

Resection after Perforation of the Ileum.

Dr. Mackellar then reported a case of resection of the terminal part of the ileum following perforation of the ileum at operation upon a gangrenous appendix. The ileum had been anastomosed to the transverse colon, end-to-side, through a high transverse incision, after the gangrenous appendix and ileum had been resected through a Rutherford-Morrison incision. The wounds were closed without drainage, and recovery had been uneventful. Full use was being made of penicillin and sulphadiazine.

Correspondence.

THE BANCROFT ORATION: STAGES IN THE DEVELOPMENT OF THE OPERATIVE SURGERY OF PROSTATIC OBSTRUCTION.

SIR: Sir Henry Newland's Bancroft Oration was a masterly review of the "Stages in the Development of the Operative Surgery of Prostatic Obstruction", and as such, will be treasured for its historical value by urologists and surgeons alike.

It is with considerable diffidence that I feel impelled to draw attention to some fundamental inaccuracies in the description of the "Harry Harris operation". In the "Classification", Sir Henry dates the operation as 1929, whereas it was presented before the Australasian Medical Congress

at Dunedin, New Zealand, in February, 1927. Sir Henry follows with what purports to be a description of the Harry Harris operation, and to this I must take exception:

1. "After enucleation of the prostate under bright electrical illumination. . . ." The prostate is enucleated by the intra-urethral bimanual method prior to the use of any electrical illumination.

2. "... hæmorrhage is minimized by the use of a trigonal tongue-shaped flap." Hæmorrhage is actually controlled by the insertion, under direct vision, of specific single hæmostatic sutures, placed round the rim of the cavity left after removal of the prostate. The trigonal suture is purely a plastic one. It pulls down and fixes in the depth of the cavity a thick muscular tongue covered with vesical mucous membrane. It prevents the possibility of ledge formation and covers over a large raw surface—in fact restoring the attachment of the trigonal muscle. No effort is made to anastomose the mucosa with the distal remnant of the prostatic part of the urethra, a fact that Harry Harris frequently emphasized.

3. "A figure-of-eight stitch controls hæmorrhage from the edges of the opening into the prostatic cavity and helps to complete the fashioning of the vesico-urethral junction around a rubber catheter." The above has no place in a Harris operation, and is obviously but one of the many so-called modifications that unfortunately have been introduced. Two, or sometimes three, anterior transverse sutures—with, of course, the retrigonalization suture—are the routine plastic reconstructive procedures. The rubber catheter has only one significant role—that of ensuring continuous drainage from the bladder, and, in fact, lies loosely in the reconstructed urethra.

4. "The suprapubic wound is completely closed except for a small tube" *et cetera*. No tube, large or small, is placed at the upper end of the incision in the bladder, and only rarely is the prevesical space drained.

5. Finally, Harris never claimed and, in fact, never attempted to obtain a primary union between the bruised and lacerated mucosa of the bladder and urethra.

I must crave indulgence for the somewhat lengthy communication, but I feel strongly that, in justice to the memory of Harry Harris, such glaring inaccuracies in an historical review should be promptly corrected.

Yours, etc.,

RICHARD G. S. HARRIS.

185 Macquarie Street,
Sydney,
March 14, 1950.

A MORE REALISTIC VIEW OF TUBERCULOSIS.

SIR: In a long letter in THE MEDICAL JOURNAL OF AUSTRALIA of March 18, 1950, Dr. White discusses several aspects of tuberculosis and praises the British and American associations for their efforts to educate the public. He might have added that the Anti-Tuberculosis Association of New South Wales, which is affiliated with the National Association for the Prevention of Tuberculosis, London, has done similar work for forty years.

Yours, etc.,

GUY GRIFFITHS, M.D.

131 Macquarie Street,
Sydney,
March 17, 1950.

VESICO-CERVICAL FISTULA.

SIR: On my return from a recent visit abroad it was interesting to find in THE MEDICAL JOURNAL OF AUSTRALIA, January 7, page 12, the report of a case of vesico-cervical fistula by Malcolm J. L. Stening, F.R.C.S. An almost identical case was reported by me in the same journal on December 16, 1922, but in my case all the urine was emptying, via the cervix, into the vagina. The case was of particular interest in that the right ureter had been severed and the right kidney was atrophied. As in Mr. Stening's case, the condition was cured by hysterectomy and partial vaginectomy. The case report received favourable mention in the surgical journals of North America, and under the circumstances it is surprising that such conditions are not described as routine in manuals of obstetrics and gynaecology.

Yours, etc.,

H. BULLOCK.

155 Macquarie Street,
Sydney,
March 15, 1950.

Post-Graduate Work.

A TRAVELLING SCHOLARSHIP IN ANÆSTHESIA.

THE Association of Anaesthetists of Great Britain and Ireland has generously voted the sum of £500 sterling to defray the living expenses of an Australian anaesthetist during a year's training in Britain, which will be arranged by the Association. The essential conditions of the award are (a) that the recipient be under the age of forty years and (b) that he or she undertake to return to Australia at the end of the period of training and there engage in the practice of anaesthesia.

The candidate will be selected by the Federal Executive Committee of the Australian Society of Anaesthetists. Points which will guide the committee in making its selection are the following, none of which are necessarily conclusive: (i) whole-time practice in anaesthesia; (ii) affiliation to a university or teaching hospital; (iii) possession of a diploma or the first part of a diploma in anaesthesia.

The candidate is expected to provide his own passage to and from Britain. Assistance will be given, however, in arranging a ship's surgeoncy if desired.

Application giving full name, address, date of birth, date of graduation and degrees, medical school, academic distinctions during undergraduate course, work done as a resident medical officer at a hospital, other post-graduate work and the names and addresses of three referees with knowledge of character and ability in anaesthesia should be made to the Honorary Secretary, Australian Society of Anaesthetists, 10 Montrose Avenue, Netherby, Adelaide, South Australia, before May 1, 1950. Applications should be type-written, ten copies being submitted. Personal canvass will disqualify. A married candidate should specify whether he/she would travel alone or accompanied by family.

THE MELBOURNE PERMANENT POST-GRADUATE COMMITTEE.

PROGRAMME FOR MAY.

Courses for Part I of Higher Degrees and Diplomas.

UNIVERSITY CLASSES for candidates for Part I of the M.D., M.S., D.D.R., D.A., D.P.M., and D.G.O., and pathology classes for candidates for Part II of the diplomas, which commenced in March, will be continued.

Courses Suitable for M.D. II, M.R.A.C.P.

The following courses are suitable for candidates for the M.D. Part II and M.R.A.C.P., but are open to all practitioners.

Course in Paediatric Disorders.

A course in paediatric disorders, arranged by Dr. Mostyn Powell, will be conducted at the Children's Hospital, Carlton, on the following dates, commencing at 2 p.m., in the lecture theatre.

Thursday, April 27: "Congenital Hearts", discussion and demonstration by Dr. M. L. Powell.

Tuesday, May 2: "Nephritis in Childhood", Dr. R. Southby.

Thursday, May 4: "Meningitis and its Treatment in Childhood", Dr. S. Williams.

Tuesday, May 9: "Chronic Pulmonary Lesions in Childhood", Dr. Medwyn Hutson.

Thursday, May 11: "Disorders of the Liver and Spleen in Childhood", Dr. J. Colebatch.

Tuesday, May 16: "Disorders of the Renal Tract in Childhood", Dr. N. Wettenhall.

The fee for this course is £3 3s., or 10s. 6d. per demonstration.

Course in Endocrinology.

A course in endocrinology, arranged by Dr. Keith D. Fairley, will be conducted on the following dates, commencing at 2 p.m.

Thursday, May 18: "The Endocrines and Carbohydrate Metabolism", Dr. Ewen Downie, at the Alfred Hospital.

Tuesday, May 23: "Diseases of the Adrenal Glands", Dr. R. Andrew, at the Alfred Hospital.

Thursday, May 20: "Diseases of the Pituitary Gland", Dr. J. Bolton, at the Royal Melbourne Hospital.

Tuesday, May 30: "Diseases of the Thyroid Gland", Dr. K. D. Fairley, at the Royal Melbourne Hospital.

Thursday, June 1: "Diseases of the Parathyroid Glands", Dr. J. Biggins, at Saint Vincent's Hospital.

Tuesday, June 6: "The Endocrinology of the Female", Acting Professor J. W. Johnstone, at the Women's Hospital. The fee for this course is £3 3s., or 10s. 6d. per demonstration.

Lectures by Visitors from the Mayo Clinic.

On Monday, May 8, 1950, the following lectures will be given by visitors from the Mayo Clinic in the Medical Society Hall, the first commencing at 8 p.m.: Dr. O. T. Clagett, "The Suppurative Diseases of the Lung"; Dr. Lee Eaton, "Myasthenia Gravis: Its Diagnosis and Management". There will be no charge for attendance.

Country Course at Camperdown.

Dr. Howard Williams will lecture on "Medical Emergencies in the Newly Born" at Camperdown on Saturday, May 13, 1950, at 8.30 p.m. The fee for this lecture is 10s. 6d. and enrolments may be made with the Secretary of the subdivision, Dr. W. R. Angus, 214 Korot Street, Warrnambool, telephone 52.

Enrolments.

Enrolments for metropolitan courses should be made with the Secretary of the Post-Graduate Committee, 426 Albert Street, East Melbourne (JM 1547), at least two weeks before commencement of the course.

Obituary.

MARK CLAYSON GARDNER.

DR. MARK GARDNER, whose death was announced recently in this journal, was one of those who had a pervading influence for good throughout the whole of his professional life. His career has been recorded in the several personal tributes of his friends which are published herewith. Among the many activities in which he took part must be numbered the affairs of the Victorian Branch of the British Medical Association. He served as a member of the Branch Council from 1933 to 1938. He was President of the Section of Ophthalmology of the Fifth Session of the Australasian Medical Congress (British Medical Association) held at Adelaide in 1937. He was one of the founders of the Medico-Legal Society of Victoria in 1931 and its President in 1935. Apart from this we must allow his friends to speak for him.

Dr. A. S. Anderson writes: I first met Mark Gardner when he took up work at the Victorian Eye and Ear Hospital on his return from England in 1923. From that date our professional association became increasingly intimate and acquaintance rapidly ripened into friendship. I was assistant in his clinic for several years and sat under his chairmanship of the honorary medical staff from 1926 until his retirement twenty years later.

Mark himself said that his best work for the hospital was done in his capacity as member of the Board of Management where he strove tirelessly and successfully for the proper recognition of the opinions and needs of the honorary medical staff. But I think that his colleagues will remember him best when in the chair at our staff meetings. Slumped down in his chair like a genial Buddha and hidden at times behind the smoke of his cigar, he guided our deliberations with wisdom, tact and toleration. His most outstanding characteristics were quickness and courage.

He was quick in thought, quick in arriving at a decision and quick in action. This last was best exemplified in the operating theatre where his work was almost incredibly rapid, yet accurate and deft to a degree that excited our envy. Yet he achieved this speed without effort, whistling almost soundlessly all the time.

None could gainsay his courage which was strikingly demonstrated in the wonderful recovery he made from his serious horse accident in 1940 and during the ill health which dogged him in latter years. It was pitiable to see his strength and vitality fading, but inspiring to note the courage with which he refused to admit defeat.

He was one who "cracked tough". His manner of speech was abrupt, even brusque, but this was due in part to his natural quickness of thought and decision and in part, a defence mechanism, for, though he shunned all expression of sentiment, he had a very warm heart.

The good he did was done by stealth, and many of us learned only after his death of deeds of kindness and of generosity performed by him, notably his long and active association with Legacy.

Sympathy he scorned, but, during his later years, it was noticeable that he seemed to set a higher value on the companionship of his friends and to draw comfort and strength from their fellowship.

His end was as he would have chosen—an operation in the morning, a sudden seizure at his rooms during the early afternoon, and a painless passing with the ending of the day.

The staff of the hospital will miss his genial and outstanding personality and extends to his wife and family its deep and sincere sympathy.

Dr. John Kennedy writes: I knew Mark as a student. I saw a little of him in England in our post-graduate days, and have been fairly closely associated with him in industrial work during the last twenty-five years.

He was an independent type of man. Played his game—cricket or golf or the great game of life—in his own style and in his own way. Why he selected ophthalmology for his specialty was his own business, but once done, he spared not time or effort in making himself as efficient a specialist as was mentally possible.

If such a little thing as a war had to be attended to he got busy with that and then went back to his eye work. Thus he did not return to Australia until about 1922 when the war was history and most hospital jobs were filled, and his old pals were more or less tied up. It was characteristic of him that he did not write to us or come to see us and let us know what he was going to do and that he would be glad to have the opportunity of placing his knowledge at the service of our patients. He asked nothing of any man, yet he was glad of the work when it came his way.

Quite a few of our younger eye specialists can thank him for the work which came their way. Always the same approach: "Do you know so-and-so? He is a good chap—straight, does a good job of work and will never let it down. Plays the game. Is having a tough time. What can we do?" He was never influenced in these recommendations by the old school, by creed, or by any other association. He discriminated on the man and nothing else.

His entrance into industrial work was as one would expect from him—unsought—and not the result of efforts of influential friends. One day in 1924 the accident manager of a prominent organization called me on the telephone to inquire about a new eye specialist—Dr. Mark Gardner. A report from him had been produced on behalf of an injured worker. It presented the medical aspects of a most difficult case in such a manner that all parties were greatly assisted in reaching a speedy, satisfactory conclusion, and it seemed as though all concerned in industrial eye work would very well be assisted by such a man. What did I advise? My reply was to create the position of eye specialist and to request me to ask him to apply for it. This was carried out that afternoon. The appointment of consulting eye specialist produced exactly the results anticipated. The unions found they could place complete confidence in his reports and that their claimant members secured the benefit of the advice of a specialist at no expense to themselves. Disputes became rare, and in twenty-five years the number of contested cases in regard to eye injury claims could be counted on the fingers of one hand.

With the great increase in secondary industry in Victoria since the early 1930's it is only natural that there should be a corresponding increase in eye injuries, but not until 1935 was any money provided by the *Workers' Compensation Act* for medical treatment. Cases of, for example, metal splinters in the eye were treated by workmates, busy lodge doctors, and the overworked casualty departments of public hospitals. Ulcerations of the cornea with prolonged disability and more or less opacity were common. There was a seemingly never-ending crop of corneal ulcers leaving vision defects, and lost eyes through foreign bodies in the posterior chamber. This meant an appalling loss—to the worker and the community. The matter became so serious that it was referred to me by the general manager of the organization. He asked me what could be done. I discussed the problem with Mark. He summed up in very few words—all cases must be seen by an eye specialist no matter how apparently trivial they seemed. I presented this report to the general manager, and he agreed to give it a trial for three months. A system was organized and at first Mark himself saw all the cases. He was joined later by Dr. Arthur Joyce. Soon results appeared. The number of cases of ulceration of the cornea of any degree began to diminish.

The period of disablement shortened and vision defects and lost eyes practically disappeared. The system showed such benefits that at the end of the three months there was no question of its being terminated. It continued during the succeeding years until 1935, when payment for treatment was first introduced into the *Workers' Compensation Act*. It then developed into a panel of eye specialists whom injured workers could attend straight from the job immediately after injury occurred.

World War II made tremendous demands on secondary industry, particularly on all branches of the metal trades. The volume of eye work increased proportionately, and the number of specialists on the panel was increased so that a continuous service six days a week was given during daylight hours. The two men undertook to be responsible for the working of the panel, and were very punctilious in rendering this national service, not only in giving priority of treatment of industrial cases over private work, but also in acting for anyone who could not adhere to his roster time.

Mark was a very strong personality, quite fearless, and probably quite tactless when anything was not as it should be. He asked nothing for himself, but a lot for others. He only knew one way with his work—he took nothing for granted no matter what trouble it entailed—and gave the best of himself in its service.

Dr. J. A. H. Sherwin writes: Reference has already been made to Dr. Mark Gardner's scholastic achievements, professional ability and great athletic record—facts well known to all his colleagues and acquaintances.

There are other traits in his character remembered even better by his friends of nearly forty years ago. These in particular were his spontaneous enthusiasm for all out-door activities and an inherent love of adventure. These have been demonstrated by his actions in the past.

Having completed his terms of office as resident surgeon at the Melbourne and Children's Hospitals, Mark Gardner proceeded overseas for further post-graduate studies.

Shortly after his arrival in London hostilities broke out in the Balkan States, Turkey most unwisely declaring war on her neighbours (a move which ultimately altered the

map of south-eastern Europe and resulted in "Turkey in Europe" practically ceasing to exist as such).

The Balkan States at this time were sadly lacking in army medical services, and appealed to the British Red Cross Society for assistance. Field units consisting of surgeons, dressers and orderlies with surgical stores and equipment were dispatched to Bulgaria, Serbia, Greece, Montenegro and Turkey, the five States involved in this Balkan War of 1912-1913. Mark Gardner, at once scenting adventure, applied for a surgeon's appointment in one of these units. He was fortunate in being allotted to that proceeding to Turkey, and during the war performed invaluable service and at the same time had many interesting and exciting experiences in the field with the Turkish army.

Scarcely had he returned to London at the conclusion of the Balkan War, when World War I broke out and thus another golden opportunity for active service arose, an opportunity which he promptly seized. Few members of our medical services have served in so many theatres, or with such distinction, whether in the forward areas in France, in a hospital unit in Salonica in Greece, in a field ambulance in East Africa, a hospital ship in Russia or on land again in Belgium. Mark Gardner was always in the "midst of things" and well merited the award of his Military Cross.

One thinks if he had lived 100 years ago and in a different environment his spirit of adventure would have carried him far and left a mark on the history of our nation, and even in these more modern times of stress and competition of the many millions his was an example of the type of man so many feel they themselves would like to be.

Dr. H. F. Maudsley writes: Mark Gardner had just been elected captain of Melbourne Grammar School the year I came up from the Preparatory School as a small and insignificant boy. I have vivid memories of his prowess in sport. Small in stature, but with all the qualities of leadership, he not only kept discipline, but saw that the small fry were not bullied by the larger boys. He excelled in sport, kept wickets for the first eleven, was 100 yards sprinter, and was athletic champion of the school. This was before the days of the public school combined sports.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED MARCH 18, 1950.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory. ²	Australian Capital Territory.	Australia. ³
Ankylostomiasis	•	2	•	•	•	•	•	•	2
Anthrax	•	•	•	•	•	•	•	•	•
Beriberi	•	•	•	•	•	•	•	•	•
Bilharziasis	•	•	•	•	•	•	•	•	•
Cerebro-spinal Meningitis	2(1)	•	1	•	2(1)	•	•	•	5
Cholera	•	•	•	•	•	•	•	•	•
Coastal Fever(s)	•	•	•	•	•	•	•	•	•
Dengue	•	•	•	•	•	•	•	•	•
Diarrhoea (Infantile)	•	•	8(8)	•	•	•	•	•	8
Diphtheria	11(7)	4(1)	4(4)	2(1)	3(3)	•	•	•	24
Dysentery (Amoebic)	•	•	•	•	•	•	•	•	•
Dysentery (Bacillary)	•	•	20(20)	•	1	•	•	•	21
Encephalitis Lethargica	•	•	•	•	•	•	•	•	•
Erysipelas	•	•	•	•	•	•	•	•	•
Filariasis	•	•	•	•	•	•	•	•	•
Helminthiasis	•	•	•	•	•	•	•	•	•
Hydatid	•	1	•	•	•	•	•	•	1
Influenza	•	•	•	•	•	•	•	•	•
Lead Poisoning	•	•	•	•	•	•	•	•	•
Leprosy	•	•	1	•	•	•	•	•	1
Malaria(b)	•	•	•	•	•	•	•	•	•
Measles	•	•	•	5(2)	•	•	•	•	5
Plague	•	•	•	•	•	•	•	•	•
Poliomyelitis	7	8(3)	1(1)	37(32)	1	•	•	•	54
Pottacosis	•	•	•	•	•	•	•	•	•
Puerperal Fever	•	•	•	•	1(1)	•	•	•	1
Rubella(c)	•	•	•	•	•	•	•	•	•
Scarlet Fever	16(8)	27(12)	4(1)	15(9)	1	3	•	•	96
Smallpox	•	•	•	•	•	•	•	•	•
Tetanus	•	•	•	•	•	•	•	•	•
Trachoma	•	•	•	•	•	•	•	•	•
Tuberculosis(d)	40(35)	8(2)	10(7)	8(6)	1	9(7)	•	•	76
Typhoid Fever(e)	•	•	•	•	1(1)	1	•	•	2
Typhus (Endemic)(f)	1	•	5(1)	•	4(2)	•	•	•	10
Undulant Fever	•	•	•	•	•	•	•	•	•
Well's Disease(g)	•	•	•	•	•	•	•	•	•
Whooping Cough	•	•	•	2(1)	•	•	•	•	2
Yellow Fever	•	•	•	•	•	•	•	•	•

¹ The form of this table is taken from the *Official Year Book of the Commonwealth of Australia*, Number 37, 1946-1947. Figures in parentheses are those for the metropolitan area.

² Figures not available.

³ Figures incomplete owing to absence of returns from the Northern Territory.

⁴ Not notifiable.

(a) Includes Mosaic and Sarina fevers. (b) Mainly relapses among servicemen infected overseas. (c) Notifiable disease in Queensland in females aged over fourteen years. (d) Includes all forms. (e) Includes enteric fever, paratyphoid fevers and other *Salmonella* infections. (f) Includes scrub, murine and tick typhus. (g) Includes leptospirosis, Well's and para-Well's disease.

Football was the game that I can best remember seeing him play. He was a fast and brilliant wing man, and played afterwards for the university and Melbourne in the League. After ceasing to play he was a keen follower of the fortunes of the Melbourne Football Club. At the university he was a triple blue—cricket, football and athletics. With all his sporting activities he had an extremely fine scholastic record at school and at the university.

The bald facts of his athletic, academic and professional prowess give one little insight into a personality, lovable, and sporting in the true sense of the word. At home in any company, whether in the outer ground when Melbourne were playing away from the Melbourne Cricket Ground, or in the Melbourne Cricket Ground committee box, his comments on the play would be sometimes provocative, and even lurid, and he would occasionally buy into an argument almost to the point of a fight, but his inherent and transparent good nature would disarm the most belligerent barracker.

Later in life he took to riding, but sustained serious injuries after a fall, and had to give up any active form of sport, but his interest in all sporting activities never ceased.

Dr. J. Bruce Hamilton writes: The warm appreciation of ophthalmology in Australia which appeared in last December's issue of *The British Journal of Ophthalmology* would have received the full approval of Mark Gardner. Fortunately, he was in unusually good spirits at the ninth annual meeting of the Ophthalmological Society of Australia held in Melbourne in October, 1949, and was able to enjoy the delightful company of the three overseas visitors to his full. For Mark Gardner was a great mixer and his stimulating remarks at all meetings of his fellow oculists was most refreshing and his name is specially mentioned in this appreciation of ophthalmology in Australia.

Mark Gardner's ophthalmology was always in the best Moorfields tradition. His house surgery under such lions as Sir John Parsons, Sir William Lester, E. Treacher Collins and Herbert Fisher were memories which he always cherished. After serving two years at Moorfields after the First World War he returned to his native Melbourne where he built up an international reputation as a consultant and where he eventually became senior ophthalmic surgeon to the Victorian Eye and Ear Hospital. His influence on this hospital was profound and on his long succession of house surgeons his impression was everlasting. His wise counsel and stimulating advice will ever be appreciated by the many men and women who on the house staff served him to their best ability.

Moorfields has produced great ophthalmologists, but it has done greater work than this—it has trained young men in the best tradition of ophthalmology and sent them forth throughout the Empire and the world to carry on their skill for the benefit of their fellow men. Mark Gardner, one of their finest scholars, did this for Melbourne which is greatly in Moorfields' and his debt.

Every member of the Ophthalmological Society of Australia, in Melbourne and throughout the Commonwealth misses him and grieves that he was suddenly taken from us so soon after such a successful annual meeting of the society in Melbourne. His great companionship will be a cherished memory for us all for many years.

GUY PERCIVAL UNDERDOWN PRIOR.

We regret to announce the death of Dr. Guy Percival Underdown Prior, which occurred on March 27, 1950, at West Ryde, New South Wales.

Royal Australasian College of Surgeons.

OPEN MEETING.

A MEETING of the Royal Australasian College of Surgeons will be held on Wednesday, April 19, 1950, in the Stawell Hall of the Royal Australasian College of Physicians, 145 Macquarie Street, Sydney, at 8.15 p.m. Professor Keith Inglis will speak on the subject "Innocent and Borderline Tumours of the Breast". The discussion will be opened by Professor H. R. Dew and Dr. A. H. Tebbutt. This meeting is open to all members of the medical profession.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Jaconelli, Joseph, M.B., B.S., 1947 (Univ. Sydney), 11 Kingsway, Cronulla.

Fitzsimons, Eric Joseph, M.B., B.S., 1950 (Univ. Sydney), 6 Kendall Street, Bondi Junction.

Diary for the Month.

APRIL 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee. Organization and Science Committee.

APRIL 17.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135 Macquarie Street, Sydney): Ashfield and District United Friendly Societies' Dispensary; Balmmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester United Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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